Annex 10

Detailed description of agri-environmental packages and the calculation of the amount of agri-environmental payment

Methodological principles for calculation of agri-environmental payments under the agri-environmental programme

Agri-environmental payment is paid as a lump sum and constitutes compensation for the income foregone, additional costs incurred and transaction costs[1].

Indicators characteristic for Polish agricultural holdings (average for 2001, 2002, 2003)

No	Indicators of agricultural holdings	Data	Source of data
1.	**Average size of an individual agricultural holding (ha)**		
	Total area (ha)	8.20	CSO
	Agricultural land area (ha)[2]	7.30	
2.	**Average LU[3] per 1ha of MFA**	**1.20**	
3.	**Average LU per 1ha of MFA[4] under extensive conditions[5]**	**0.76**	
4.	**Standard Gross Margin (SGM) per 1ha of utilised agricultural area (PLN) in 2002**	**1400**	agricultural accountancy[6] + CSO
5.	**Standard Gross Margin per 1ha of utilised agricultural area under extensive conditions (PLN) in 2002**	**1029**	
6.	**Standard gross margin per 1 LU[7] in 2002 (PLN)**	**1543**	agricultural accountancy + CSO
7.	**Standard Gross Margin per 1 LU for fattening in 2002 (PLN)**	**802**	agricultural accountancy + CSO
8.	**Average hay yield (dt/ha)**	**45.8**	CSO

[1] Agri-environmental payments are calculated as a percentage share of the income foregone and of additional costs, taking into account priorities of the programme.
[2] In holdings carrying out agricultural activity.
[3] LU – livestock unit (cattle, horses, sheep, goats, with cattle constituting 90%)
[4] MFA – main fodder area
[5] Farming system based on traditional low productivity methods.
[6] Data based on the results of agricultural accountancy covering over 12,000 individual agricultural holdings.
[7] An animal kept under extensive conditions.

Methodological principles for calculation of indicators characteristic of agricultural holdings:

Agricultural accountancy for individual holdings covers over 12,000 agricultural holdings. Within the framework of the accountancy the data are collected as broken down by particular plant and animal production activities which may be standard (high yield and high fertilisation) or extensive (low yield and low fertilisation).

SGM – Surplus of the value of production within a particular agricultural activity over the value of direct costs (seed, fertilisers, plant protection products, crop insurance) under standard conditions.

SGM per 1ha of utilised agricultural area in 2002 – weighted average of the sum of SGM products for each plant production activity and of weighted average crop structure of utilised agricultural area over the period 2001-2003 (with the mid-year, i.e. 2002, being characteristic of the SGM); it constitutes the reference point for the calculation of income foregone due to extensive production.

SMG per 1ha of utilised agricultural area under extensive conditions in 2002 – average sum of SGM products for each extensive plant production activity[8] and of weighted average crop structure of utilised agricultural area over three consecutive years.

Extensive conditions are when agricultural holdings use small amounts of mineral fertilisers and reduced amounts of plant protection products and do not use certified seed for cultivation. Such holdings are characterised by low yield of marketable output, their production is based on low direct costs and is allocated mostly for own use. According to the data of agricultural accountancy for individual holdings, the use of mineral fertilisers per 1ha of agricultural land in extensive holdings is around 45% lower than the average use in other holdings. Yielding in extensive holdings, e.g. of cereals, is almost 70% lower than the average yielding in other agricultural holdings. The value of plant production income in extensive holdings amounts to only 52% of the average plant production income in other holdings.

Income foregone due to extensive production is equal to the result of subtraction of SGM per 1ha of utilised agricultural area in 2002 and SGM per 1ha of utilised agricultural area in 2002 under extensive conditions, i.e. 1400-1029 = PLN 371.

[8] Extensive plant production means the plant production with low yield and low fertilization level, e.g. for cereals low yield is 24 dt/ha and with medium sized for cereals it is 35.3 dt/ha.

Standard Gross Margin per 1 LU in 2002 (PLN) – Surplus of the production value over the value of direct costs under standard conditions.

Package 1. Sustainable farming

Variant 1.1 Sustainable management system

Description: Management in sustainable farming consists in rational use of natural resources, allowing for limiting the negative impact of agriculture on the environment.

The management based on soil analysis and the fertilization plan constitutes the basic measure in environmental planning in the correct agricultural management. The purpose of environmental planning is the appropriate use of fertilisers, taking into account the needs of individual plants and the content of P, K, and Mg in the soil. The appropriate use of fertilisers, i.e. the adjustment of the nitrate dose to the current needs of the plants, reduces the emission of nitrogen oxide to the atmosphere. In addition, it prevents the permeating of components of fertilisers, especially nitrogen and phosphorus, to surface and ground waters. This is of a great importance for the environment, especially in areas with light soils susceptible to washing out of nutrients, including, most importantly, nitrate.

Soil analysis will allow for the application of optimum amounts of fertilisers, which then would allow for avoiding the introduction of the excessive amounts thereof to the soil. Such procedure will help to achieve a positive environmental effect by limiting washing out of fertilisers and their accessing the ground water.

The sustainable management prevents the depletion of organic substance in the soil. The decomposition of organic substance has a very adverse impact on the environment due to the release of a large amount of mineral compounds, particularly nitrates, which may lead to the pollution of waters.

Observance of the correct selection and sequence of crops guarantees that the agrophagus population development may be limited, weed development is reduced and nitrate losses are limited.

Objective: Promotion of sustainable management system

Requirements of Variant 1.1.:

- the variant covers the whole agricultural holding and the agri-environmental payment concerns only arable land;
- the obligation to prepare and observe fertilisation plan each year, on the basis of the nitrate balance and current chemical analysis of soil,

with the determination of P, K and Mg content and liming needs[9] and the appropriate selection and sequence of crops in crop rotation and the determination of nitrate doses;

- the obligation to mow or graze on the permanent grassland;
- ban on the use of sewage sludge;
- maximum nitrate content (originating from natural fertilizers, compost and mineral fertilizers) on arable land should not exceed 150 kg N/ha, and in permanent grassland 120 kg N/ha;
- the obligation to maintain the areas of permanent grassland and elements of the landscape which are not used for agricultural purposes.

Volume of agri-environmental payment – PLN 360 / ha

The agri-environmental payment is granted to the amount of:

(1) 100% of the basic rate for the area of 1 ha to 100 ha;

(2) 50% of the basic rate for the area of 100.01 ha to 200 ha;

(3) 10% of the basic rate for the area exceeding 200 ha.

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Income lost		
1.	Income lost due to the extensive production	x	
	Additional costs		
2.	Soil analysis	x	
3.	The cost of preparing nitrate balance for the average size of agricultural holding	x	
Estimated balance of costs and benefits		440 PLN	
PROPOSED LEVEL OF PREMIUMS (82%)		**360 PLN/ha (92,2 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of standard gross margin (SGM) for 1 UAA in 2002 and SGM for 1 UAA under extensive conditions in 2002 based on data of Central Statistical Office and data of Agricultural Accountancy Department of

[9] Only in the cases justified environmentally, after the consultation with agri-environmental advisor.

the Institute of Agricultural and Food Economics - National Research Institute (IAFE NRI) for 2001-2003.
2. Two samples per hectare x cost of soil analysis prepared once for 5 years based on data of district agrochemical stations.
3. cost of fertilizers balance prepared annually for average area of UAA in Poland based on data of Institute of Plant Cultivation and Soil Science in Puławy.

Package 2. Organic farming

Variant 2.1 Agricultural cultivation (with conformity certificate);
Variant 2.2 Agricultural cultivation (in transition period);
Variant 2.3: Extensive permanent grassland (with conformity certificate);
Variant 2.4: Extensive permanent grassland (in transition period);
Variant 2.5 Vegetable cultivation (with conformity certificate);
Variant 2.6 Vegetable cultivation (in transition period);
Variant 2.7. Herbs cultivation (with conformity certificate);
Variant 2.8 Herbs cultivation (in transition period);
Variant 2.9. Horticultural and berry cultivation (with conformity certificate);
Variant 2.10. Horticultural and berry cultivation (in transition period);
Variant 2.11 Other horticultural and berry cultivation (with conformity certificate);
Variant 2.12. Horticultural and berry cultivation (in transition period);

Description: The package covers agricultural holdings switching to organic farming methods and organic farms with valid certificate issued by authorised certifying unit in accordance with relevant legislation on organic farming.

Objective: Promotion of sustainable management system

Requirements of the package:

- maintenance of agricultural production in accordance with the rules specified in the act on organic farming and Council Regulations (EC) No. 2092/91 and 1804/99;
- plant cultivation in accordance with the best knowledge and agricultural culture, maintaining due care for the phytosanitary condition of plants and soil protection;
- in the case of implementation of variants 2.3. and 2.4. there is an obligation to remove or stack the cut biomass not later than 2 weeks after mowing (except for particularly justified cases);
- the allocation of the yield for the production of organic feedstuffs, for direct feeding, transfer to other holdings or other use, e.g. for compost;

- In the case of implementation of Variants 2.9, 2.10, 2.11, 2.12 nursery materials must meet specific requirements[10];
- in the case of implementation of variants 2.9, 2.10, 2.11, 2.12 there is an obligation to carry out cultivation treatment on plantations every year; the yield should be intended for direct consumption, for processing or for feedstuffs;
- the obligation to maintain the areas of permanent grassland and elements of the landscape which are not used for agricultural purposes.

The process of inspection of holdings in the transitional period and in the period of certified production is regulated by the rules laid down in the Council Regulation 2092/91/EEC of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs. Inspections carried out by certifying authorities cover all farms which have certificate or are under conversion. Inspection procedures distinguish four types of sanctions: admonition, warning, suspension and withdrawal of certificate. They concern the incompliance with the requirements of organic farming. The withdrawal of the certificate means the lack of agri-environmental payment.

Due to the current situation on the organic products market, which is beginning to appear in Poland, the price of organic products is not significantly higher than the price of traditional products. In addition, the difference in the price of those products is not a benefit of the farmer (i.e. producer) but of the intermediaries. Owing to the abovementioned, payment calculation in organic farming does not take into account higher prices of products in case of certified production. Rates offered to uncertified farms take into account, in the first place, losses which arose as a result of poorer crops in the first years (up to 3 years) during conversion from conventional to organic farming (for example more weeds, more workload). As a result of undertaken promotional measures for organic farming, the situation on the market may change and influence the increase in the prices of organic products. In such a situation, the revision of the payment calculation for this package could be considered.

Amount of agri-environmental payments:

Agricultural cultivation (in transition period) – **840 PLN / ha**
Agricultural cultivation (with conformity certificate) – **790 PLN / ha**;

[10] Ordinance of the Minister of Agriculture and Rural Development of 8 March 2004 on the requirements concerning the production and quality of seed material (Dz. U. Nr 59 item 565)

Permanent grassland (in transition period) – **330 PLN / ha**;
Permanent grassland (with conformity certificate) – **260 PLN / ha**;
Vegetable cultivation (in transition period) – **1550 PLN / ha**;
Vegetable cultivation (with conformity certificate) – **1300 PLN / ha**;
Herbs cultivation (in transition period) – **1150 PLN / ha**;
Herbs cultivation (with conformity certificate) – **1050 PLN / ha**;
Horticultural and berry cultivation (in transition period) – **1800 PLN / ha**;
Horticultural and berry cultivation (with conformity certificate) – **1540 PLN / ha**;
Other horticultural and berry cultivation (in transition period) – **800 PLN / ha**;
Other horticultural and berry cultivation (with conformity certificate)– **650 PLN / ha**.

The agri-environmental payment is granted to the amount of:

(1) 100% of the basic rate for the area from 1 ha to 100 ha;

(2) 50% of the basic rate for the area from 100.01 ha to 200 ha;

(3) 10% of the basic rate for the area exceeding 200 ha.

Payment calculation:

Organic farming - agricultural cultivation (in transition period)

	Measures undertaken	Cost	Benefit
	Income lost		
1.	20% losses of yield value	x	
	Cost savings		
2.	In means of production (direct costs)		x
	Additional costs		
3.	Additional workload	x	
4.	Higher fuel consumption relating to mechanical weed protection	x	
5.	Rental of a manure spreader	x	
Estimated balance of costs and benefits		931	
PROPOSED LEVEL OF PREMIUMS (90%)		**840 PLN/ha (215.2 EUR/ha)**	

1. % of losses of yield value for arable crops , based on organic farms in the period of transition from conventional to organic farming in 2001-2003 (average yield value for arable crops of x loss of yield value for arable crops) - according to the Agricultural Accountancy Department of the Institute of Agricultural and Food Economics, National Research Institute (IAFE NRI);
2. Cost saved on means of production (direct costs), based on organic farms in the period of transition from conventional to organic farming for agricultural crops in 2001-2003 - according to the Agricultural Accountancy Department of IAFE NRI;
3. Additional work load, based on organic farms in the period of transition from conventional to organic farming in 2001-2003 (additional work load x cost per man-hour) - according to the Agricultural Accountancy Department of IAFE NRI;
4. Higher fuel consumption relating to mechanical weed protection, based on the data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003. *Koszty eksploatacji maszyn*, IBMER, Warsaw), according to the Agricultural Accountancy Department of IAFE NRI;
5. Rental of a manure spreader (number of MH needed for spreading manure x cost of manure spreader operation within 1 man-hour), according to the Agricultural Accountancy Department of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*).

Organic farming - agricultural cultivation (with conformity certificate)

	Measures undertaken	Cost	Benefit
	Income lost		
1	15% losses of yield value	x	
	Cost savings		
2.	In means of production (direct costs)		x
	Additional costs		
3.	Additional workload	x	
4.	Higher fuel consumption relating to mechanical weed protection	x	
5.	Rental of a manure spreader	x	
Balance of costs and benefits		799 PLN	
PROPOSED LEVEL OF PREMIUMS (99%)		**790 PLN/ha (202.4 EUR/ha)**	

1. % of losses of yield value for arable crops based on organic farms in 2001-2003 (average yield value for arable crops x loss of yield value for arable crops x - according to the Agricultural Accountancy Department of the Institute of Agricultural and Food Economics, National Research Institute (IAFE NRI);
2. Cost saved on means of production (direct costs), based on organic farms for arable crops in the period of 2001-2003 - according to the Agricultural Accountancy Department of IAFE NRI;
3. Additional work load, based on organic farms in the period of transition from conventional to organic farming in the period of 2001-2003 (additional work load x cost per man-hour) - according to the Agricultural Accountancy Department of IAFE NRI;
4. Higher fuel consumption relating to mechanical weed protection, based on the data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003. *Koszty eksploatacji maszyn*, IBMER, Warsaw), according to the Agricultural Accountancy Department of IAFE NRI;
5. Rental of a manure spreader (number of MH needed for spreading manure x cost of manure spreader operation), according to the Agricultural Accountancy Department of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*).

Organic farming - Permanent pastures (with and without conformity certificate)

	Measures undertaken	Cost	Benefit
	Income lost		
1.	Lower straw yield by 20dt	x	
	Cost savings		
2.	Savings in costs of fertilization		x
Estimated balance of costs and benefits		409 PLN	

PROPOSED LEVEL OF PREMIUMS without certificate (81%)	**330 PLN/ha (84.5 EUR/ha)**
PROPOSED LEVEL OF PREMIUMS with certificate (64%)	**260 PLN/ha (66.6 EUR/ha)**

1. the loss of yield value based on data from organic farms and holdings in the transition period from conventional to organic system between 2001 and 2003 (the loss of yield value for permanent grasslands x value of 1 dt of hay) - according to Agricultural Accountancy Department of the Institute of Agricultural and Food Economics (IAFE), National Research Institute (NRI);
2. savings in fertilization costs between 2001 and 2003, (price of 1 kg of pure NPK component x fertilisation cost), according to the Agricultural Accountancy Department of IAFE NRI.

Organic farming – vegetable cultivation (in transition period)

	Undertaken activities	Cost	Benefit
	Lost income		
1.	20% loss of yield value	x	
	Cost savings		
2.	Savings in means of production (direct costs)		x
	Additional costs		
3.	Additional work load	x	

4.	Higher fuel consumption on account of mechanical weed protection	x	
5.	Manure spreader rental	x	
Balance of costs and benefits		1,926	
PROPOSED LEVEL OF PREMIUMS (80%)		**1,550 PLN/ha (397 EUR/ha)**	

1. % of loss of yield value for vegetable cultivation based on data from organic farms in the transition period from conventional to organic system between 2001 and 2003 (average yield value for vegetable cultivation amounting to x the loss of yield value) according to Horticultural Economics Department of IAFE NRI;
2. savings in means of production (direct costs) based on data from organic farms in the transition period from conventional to organic system between 2001 and 2003 (vegetable cultivation, according to Horticultural Economics Department of IAFE, NRI);
3. additional work load based on data from organic farms in the transition period from conventional to organic system between 2001 and 2003 (additional work load x cost per manhour), according to Horticultural Economics Department of IAFE, NRI;
4. higher fuel consumption on account of mechanical weed protection, based on the data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. *Koszty eksploatacji maszyn*, IBMER, Warsaw), according to the Agricultural Accountancy Department of IAFE NRI;
5. manure spreader rental (number of MH needed for spreading manure x cost of manure spreader operation) according to the Agricultural Accountancy Department (Klementowski A. *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy* 2001-2003).

Organic farming - vegetable cultivation (with conformity certificate)

	Undertaken activities	**Cost**	**Benefit**
	Lost income		
1.	15% loss of yield value	x	
	Cost savings		
2.	in means of production (direct costs)		x
	Additional costs		
3.	Additional work load	x	
4.	Higher fuel consumption on account of mechanical weed protection	x	
5.	Manure spreader rental	x	
Estimated balance of costs and benefits		1,381 PLN	
PROPOSED LEVEL OF PREMIUMS (94%)		**PLN 1,300 PLN/ha (333 EUR/ha)**	

1. & of loss of yield value for vegetable cultivation based on data from organic farms between 2001 and 2003, (average yield value for vegetable cultivation x the loss of yield value) according to Horticulture Economics Department of IAFE NRI;
2. savings in means of production (direct costs) based on data from organic farms between 2001 and 2003 for vegetable crops (savings for vegetable cultivation), according to Horticultural Economics Department of IAFE, NRI);
3. additional work load based on data from organic farms between 2001 and 2003 (additional work load x cost per man hour) - according to Horticultural Economic Department of IAFE, NRI);
4. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to the Agricultural Accountancy Department of IAFE NRI;
5. manure spreader rental (number of MH needed for spreading manure x cost of manure spreader operation) according to the Agricultural Accountancy Department of IAFE, NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003).

Organic farming – herbs cultivation (in transition period)

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	20% loss of yield value	x	
	Cost savings		
2.	in means of production (direct costs)		x
	Additional costs		
3.	Additional work load	x	
4.	Higher fuel consumption on account of mechanical weed protection	x	
5.	Manure spreader rental	x	
Estimated balance of costs and benefits		1,162 PLN	
PROPOSED LEVEL OF PREMIUMS (99%)		**1,150 PLN/ha (294.6 EUR/ha)**	

1. % of loss of yield value for herbs cultivation (based on data from organic farms in the transition period from conventional to organic system between 2001 and 2003 (average yield value for herbs cultivation x the loss of yield value) - according to the Institute of Soil Science and Plant Cultivation in Puławy (Krasowicz S., 2001-2003);

2. savings in means of production costs (direct costs) based on data from organic farms in the transition period from conventional to organic system (agricultural crops between 2001 and 2003 – according to the Institute of Soil Science and Plant Cultivation in Puławy, (Krasowicz S., 2001-2003);
3. additional work load based on data from organic in the transition period from conventional to organic system (additional work load x cost per manhour between 2001 and 2003 - according to Agricultural Accountancy Department of IAFE, NRI;
4. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to the Agricultural Accountancy Department of IAFE NRI;
5. manure spreader rental (number of MH needed for spreading manure x cost of manure spreader operation) according to the Agricultural Accountancy Department of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003).

Organic farming – herbs cultivation (with conformity certificate)

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	15% loss of yield value	x	
	Cost savings		
2.	in means of production (direct costs)		x
	Additional costs		
3.	Manure spreader rental	x	
4.	Additional work load	x	
5.	Higher fuel consumption on account of mechanical weed protection	x	
Estimated balance of costs and benefits		1,066 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**1,050 PLN/ha (269 EUR/ha)**	

1. % of loss of yield value for herbs cultivation based on data from organic farms (average yield value for herbs cultivation between 2001 and 2003 x the loss of yield value according to Institute of Soil Science and Plant Cultivation in Puławy (Krasowicz S., 2001-2003);
2. savings in means of production (direct costs) based on data from organic farms between 2001 and 2003 (herbs cultivation, according to Agricultural Accountancy Department of IAFE, NRI);

3. additional work load based on data from organic farms (additional work load x cost per manhour between 2001 and 2003 - according to Agricultural Accountancy Department of IAFE NRI);
4. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to the Agricultural Accountancy Department of IAFE NRI;
5. manure spreader rental (number of MH needed for spreading manure x cost of manure spreader operation) according to the Agricultural Accountancy Department of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003).

Organic farming – horticultural and berry cultivation (in transition period)

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1	50% loss of yield value	x	
	Cost savings		
2.	in means of production (direct costs)		x
	Additional costs		
3.	Additional work load	x	
4.	Higher fuel consumption on account of mechanical weed protection	x	
Estimated balance of costs and benefits		4,672 PLN	
PROPOSED LEVEL OF PREMIUMS (38%)		**1,800 PLN/ha (461.1 EUR/ha)**	

1. % of loss of yield value for horticultural and berry cultivation on a basis of data from organic farms in transition period from conventional to organic system between 2001 and 2003 (average yield value for horticultural and berry cultivation x and the loss in yield value) - according to Horticultural Economics Department IAFE NRI;
2. savings in means of production (direct costs) on a basis of data from organic farms in transition period from conventional to organic system between 2001 and 2003 (horticultural and berry cultivation according to Horticultural Economics Department IAFE NRI);
3. savings in means of production (direct costs) on a basis of data from organic farms in transition period from conventional to organic system between 2001 and 2003 (additional work load x cost per manhour), according to Horticultural Economics Department IAFE NRI;
4. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to Agricultural Accountancy Department IAFE NRI.

Organic farming – horticultural and berry cultivation (with conformity certificate)

	Measures undertaken	Cost	Benefit
	Lost income		
1.	45% of loss of yield value	x	
	Cost savings		
2.	in means of production (direct costs)		x
	Additional costs		
3.	Additional work load	x	
4.	Higher fuel consumption on account of mechanical weed protection	x	
Estimated balance of costs and benefits		4,154 PLN	
PROPOSED LEVEL OF PREMIUMS (37%)		**1,540 PLN/ha (394.5 EUR/ha)**	

1. % of loss of yield value for horticultural and berry cultivation on a basis of data from organic farms between 2001 and 2003 (average yield value for horticultural and berry cultivation x the loss in yield value amounting to 45% - according to Horticultural Economics Department IAFE NRI;
2. savings in means of production (direct costs) on a basis of data from organic farms between 2001 and 2003 (horticultural and berry cultivation according to Horticultural Economics Department IAFE NRI);
3. additional work load on a basis of data from organic farms between 2001 and 2003 (additional work load x cost of manhour) according to Horticultural Economics Department IAFE NRI;
4. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to Agricultural Accountancy Department IAFE NRI.

Organic farming – Other horticultural and berry cultivation (in transition period)

	Measures undertaken	Cost	Benefit
	Lost income		
1.	15% of loss of yield value	x	
	Additional costs		
2.	Additional work load	x	
3.	Higher fuel consumption on account of mechanical weed protection	x	
Estimated balance of costs and benefits		805 PLN	
PROPOSED LEVEL OF PREMIUMS (99%)		**800 PLN/ha (204.9 EUR/ha)**	

1. % of loss of yield value for other horticultural and berry cultivation based on data from organic farms in transition period from conventional to organic system between 2001 and 2003 (average yield value for other horticultural and berry cultivation x the loss of yield) according to Horticulture Economics Department of IAFE NRI;
2. additional work load on a basis of data from organic farms in transition period from conventional to organic system between 2001 and 2003 for other horticultural and berry cultivation (additional work load x cost of manhour) according to Horticultural Economics Department IAFE NRI;
3. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to Agricultural Accountancy Department IAFE NRI.

Organic farming – Other horticultural and berry cultivations (with conformity certificate)

	Measures undertaken	Cost	Benefit
	Lost income		
1.	10% of loss of yield value	x	
	Additional costs		
2.	Additional work load	x	

3.	Higher fuel consumption on account of mechanical weed protection	x	
Estimated balance of costs and benefits		655 PLN	
PROPOSED LEVEL OF PREMIUMS (99%)		**650 PLN/ha (166.5 EUR/ha)**	

1. % of loss of yield value for other horticultural and berry cultivation based on data from organic farms between 2001 and 2003 (average yield value for other horticultural and berry cultivation and the loss of yield value) according to Horticulture Economics Department of IAFE NRI;
2. additional work load on a basis of data from organic farms in transition period from conventional to organic system between 2001 and 2003 for other horticultural and berry cultivation (additional work load in manhour value x cost of manhour) according to Horticultural Economics Department IAFE NRI;
3. higher fuel consumption on account of mechanical weed protection on a basis of data from the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw), according to Agricultural Accountancy Department IAFE NRI.

Package 3. Extensive permanent grasslands

Variant 3.1. Extensive management on meadows and pastures

Description: The package consists in the limitation of fertilization, quantity and dates of harvest cuts or intensity of grazing. Meeting the package requirements leads to retaining the existence of rural meadows and pastures.

Objective: Retaining of the conservation status of natural habitats used for agricultural purposes

Agri-environmental payment is granted in the amount of

1) 100% of basic rate – for the area between 1 ha and 10 ha;
2) 75% of basic rate – for the area between 10,01 ha and 50 ha;
3) 50% of basic rate – for the area between 50,01 ha and 100 ha;
2) 10% of basic rate – for the area above 100 ha;

Variant 3.1. Extensive management on meadows and pastures

Definition: This variant may be implemented on land used as permanent meadows or pastures. The area covered by the variant may be used as a meadow, pasture or used as hay and pasture land. The change of land

utilisation during the agri-environmental obligation period is possible in one of the following ways.

Requirements of Variant 3.1.:

Mowing:

- mowing is allowed between 1 June and 30 September, no more than two harvest cuts a year, obligation to leave 5-10% of the agricultural parcel unmown, where it should be another part each year;
- mowing height 5 - 15 cm;
- mowing technique: mowing in circles from the outside to the inside of the parcel is prohibited;
- obligation to remove or stack the cut biomass within no more than 2 weeks time after mowing (except justified cases);

Grazing:

- maximum livestock density is 1 LU per ha;
- in the case of hay and pasture land maximum livestock density is 0.3 LU per ha;
- in the case of pasture land minimum livestock density is 0.5 LU per ha and the maximum is 1.0 LU per ha;
- maximum pasture load is up to 10 LU per ha (5t per ha)[11];
- grazing period lasts from 1 May to 15 October in the areas located below 300 m above the sea level or from 20 May to 1 October in the areas located above 300 m above the sea level;
- it is allowable to mow leavings only from August to September.
- it is allowable to graze Polish primitive horse and hutsul horse for the whole year;
- beginning of the grazing period in flooded areas no earlier than two weeks after the water recedes.

Fertilization and plant protection:

- the use of plant protection products is prohibited except for selective and local destruction of oppressive weeds with the use of appropriate equipment (e.g. weed wipers), after consulting agri-environmental adviser;
- the use of sewage and sewage sludge is prohibited;
- liming[12] of the soil and limited nitrogen fertilization (up to 60 kg per ha annually), with the exclusion of areas fertilized by river alluvia;

Melioration:

[11] Pasture load is the number of animals at a given time at the pasture, while stocking density refers to the whole grazing season

[12] Only in environmentally justified cases, after consulting the agri-environmental adviser..

- building the new melioration systems (except for equipment aimed at increasing the water levels) and development of existing melioration systems within the competences of the beneficiary is prohibited; does not apply to day-to-day maintenance;

Other treatment:

- ploughing prohibited;
- rolling prohibited;
- sod seeding prohibited;
- levelling prohibited between 1 April and 1 September.

There is an obligation to maintain the area of permanent grassland and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-envrionmental payment - PLN 500 per ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Income lost on account of extensive utilization of a given habitat	x	
	Additional costs		
2.	Removal or stacking the cut biomass	x	
Estimated balance of costs and benefits		596x	
PROPOSED LEVEL OF PREMIUMS (84%)		**500 PLN/ha (128.1 EUR/ha)**	

1. Income lost on account of extensification of production is a substraction of SGM for 2002 per 1 ha of agricultural land and SGM for 2002 per 1 ha of agricultural land in extensive conditions – according to data of CSO and Agricultural Accountancy Department of IAFE between 2001 and 2003;
2. this treatment requires the use of self-loading vehicle and a rake for an area of 1 ha – according to data of IAFE NIB (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003., Koszty eksploatacji maszyn, IBMER, Warsaw);

Package 4. Protection of endangered bird species and natural habitats outside of Natura 2000 areas

Variant 4.1. – Protection of bird breeding habitats;
Variant 4.2. – Small sedge-moss communities;
Variant 4.3 – Tall sedge swamps
Variant 4.4. - Litter meadows Molinion and Cnidion
Variant 4.5. – Xerothermic Grass;
Variant 4.6. – Semi-natural wet meadows;
Variant 4.7. – Semi-natural fresh meadows
Variant 4.8. – Species-rich Nardion grasslands
Variant 4.9. – Salt marshes;
Variant 4.10. – Natural lands.

Description: The Package consists in the limitation of fertilization, quantity and dates of mowings or intensity of grazing in nature-value areas outside Natura 2000. Meeting the requirements of Variant 4.1. leads to improvement of living conditions of endangered bird species, whose breeding sites are connected with extensive green pastures.
Variants 4.2.-4.10. include habitat types under Natura 2000 classification and other nature-value habitats in meadows and pastures. Nomenclature is compliant with the Regulation of 16 May 2005 (Dz.U. of 2004 No 94, item 95) relating to Annex I to the Habitats Directive.
Elaboration of habitat documentation is a condition for the classification of permanent green pastures to the package and implementation of tasks in a given habitat area.

Objective: Retaining the conservation status of the nature-value habitats used for agricultural purposes

Common requirements for Package 4 Variants

In the area covered by Package **Protection of endangered bird species and natural habitats outside of Natura 2000 areas,** the following activities are prohibited**:**

- ploughing;
- rolling;
- the use of sewage and sewage sludge;
- sod seeding;
- levelling between 1 April and 1 September;
- the use of plant protection products is prohibited except for selective and local destruction of oppressive weeds with the use of appropriate

equipment (e.g. weed wipers), after consulting agri-environmental adviser;

- building the new melioration systems (except for equipment aimed at increasing the water levels) and development of existing melioration systems within the competences of the beneficiary is prohibited; does not apply to day-to-day maintenance.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Transaction costs

Elaboration of flora and fauna documentation by an expert, related to accession to the package implementation, is a transaction cost. Transaction costs will be paid on a one-off basis, alongside with a agri-environmental payment for a given variant. Habitat documentation elaboration costs depend on initial area of habitat in which the agri-environmental programme will be implemented.

Variant 4.1. Protection of bird breeding habitats

Description: The variant Protection of bird breeding habitats includes breeding bird species characteristic for nature-value and endangered types of permanent grasslands, among others wet and mesic meadows mostly found in river valleys, as well as sedges and peat meadows mostly found in peat bogs. Bird species supported under this variant have their nests on the ground or among herbaceous vegetation and too early mowing or too intensive grazing may lead to destruction of their breeding grounds. On the other hand, not continuing the use of the aforementioned permanent grasslands leads to degradation of bird breeding habitats.

Requirements included in Variant 4.1. are supposed to adjust the use to the needs of selected bird species nesting on meadows and pastures. The area covered by Variant 4.1. may be used as a meadow, pasture or used as hay and pasture land. The change of land utilisation during the agri-environmental obligation period is possible in one of the following ways.

Requirements of Variant 4.1.:

<u>Mowing:</u>

- every year between 1 August and 30 September;
- obligation to leave 5-10% of the agricultural parcel unmown (in the case of aquatic warbler *Acrocephalus paludicola* – 30-50%), where it should be another part each year;
- mowing height 5 - 15 cm;

- mowing in circles from the outside to the inside of the parcel prohibited;
- obligation to remove or stack the cut biomass within no more than 2 weeks time after mowing (except justified cases);

Grazing:

- in the case of hay and pasture land the maximum animal density is 0.2 LU per ha;
- in the case of pasture land, until 20 July the maximum animal density is 2. LU per ha, whereas after 20 July the density should remain between 0.5 and 1 LU per ha;
- maximum pasture load up to 5t per ha (10 LU per ha)[13];
- grazing period: from 1 May to 15 October in areas below 300 m above the sea level, or from 20 May to 1 October in areas higher than 300 m above the sea level;
- it is allowable to mow leavings only from August to September.
- it is allowable to graze Polish primitive horse and hutsul horse for the whole year;
- beginning of the grazing period in flooded areas no earlier than two weeks after the water recedes.

Other treatment:

- liming[14] and limited nitrogen fertilization (up to 60 kg/ha/year) is allowable, with the exception of areas fertilized by river alluvia.
- application of agri-technical or maintenance treatment from 1 April to the time of first mowing prohibited.

[13] Only in environmentally justified cases, after consulting the agri-environmental adviser.
[14] Only in environmentally justified cases, after consulting the agri-environmental adviser.

Amount of agri-environmental payment is 1,200 PLN/ha
Calculation of agri-environmental payment

	Measures undertaken	Cost	Benefit
	Lost income		
1.	Income lost on account of extensive utilisation of a given habitat	x	
	Additional costs		
2.	Appropriate mowing technique	x	
3.	Purchase of additional fodder	x	
4.	Removal or stacking the cut biomass	x	
5.	Cost of leading the animals to the pasture	x	
	Additional income		
6	Additional income on fattening animals		x
Estimated balance of costs and benefits		1,371.98 PLN	
PROPOSED LEVEL OF PREMIUMS (87%)		**1,200 PLN/ha (307.4 EUR/ha)**	

1. income lost on account of extensive utilisation of a given habitat is calculated as a difference between the SGM for 2002 per 1ha of agricultural land and the SGM for 2002 per 1ha of agricultural land in extensive conditions, according to data of CSO and Agricultural Accountancy Department of IAFE between 2001 and 2003;
2. time needed for mowing x PLN cost of mowing the specific area of a meadow – according to data of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw);
3. amount of feed x price of fodder – according to data of the Agricultural Accountancy Department of IAFE for period 2001-2003 and data contained in Mały poradnik zarządzania gospodarstwem rolniczym 2002 rok, (joint publication, G. Niewęgłowska, ed.) , and according to the data of CSO and Fodder Market (joint publication, IAFE, Agricultural Market Agency, 2001-2003);
4. this treatment requires the use of self-loading vehicle and a rake on a specific area of a meadow – according to data of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw);
5. leading the animals to the pasture during the grazing season (number of days of grazing x number of manhours per day x man-hour cost), based on the data of Institute for Land Reclamation and Grassland Farming in Falenty, CSO, Mały poradnik zarządzania gospodarstwem rolniczym, 2002;

6. average density per ha under extensive conditions x the Standard Gross Margin for 2002 for fattening - based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for 2001-2003.

Variant 4.2. – Small sedge-moss communities

Variant 4.2. covers the following types of habitats defined according to the Natura 2000 classification:

- transition mires and quaking bogs (7140) (except for the substrates of the *Rhynchosporion*);
- alkaline fens (7230);
- calcareous fens (7210) of the *Caricion davallianae* – priority habitat.

Phytosociological units: widely presented *Caricion davallianae*, *Caricion nigrae* aliances, certain *Caricion lasiocarpae* and referring communities, on which the presence of identifying species will be documented.

Description: Small sedge-moss communities, i.e. short sedge, rich in bryophytes boggy meadow communities (brophyte and sedge meadows, *Caricion nigrae*) can be found on bogs fed by shallow groundwater. According to meadow typology, they are classified as so-called proper meadows and swamp meadows. Well-maintained small sedge-moss communities assemble numerous rare plant species and are a dwelling place of unique ornithofauna, including *Acrocephalus paludicola*. This species is most endangered bird species in Europe and Poland constitutes the most important sanctuary in the European Union of this species (85% of the population). Especially valuable and rare small sedge-moss communities is the one fed by waters rich in calcium compounds. On the national scale these habitats are moderately ordinary. They are especially frequent in the northern part of Poland. Within mountain areas they are mainly noted in the Sudetes.

Small sedge-moss communities were mown in a traditional manner, every 1-2 years (depending on the accessibility of the land). Hay was usually used as livestock bedding. Due to the increasing drainage of boggy habitats and abandonment of mowing, small sedge-moss communities has recently become rarer.

Abandonment of utilisation results in succession, mainly towards rushes or forest communities. Intensification of utilisation in turn results in impoverishment of species of communities. Grazing and use of heavy equipment destroy the plant and soil structure.

Requirements of variant 4.2:

<u>Mowing:</u>

- every year from 15 July to 30 September;

- the obligation to leave 50% of unmown area annually, where it should be another part each year; mowing of the whole area is allowed only once in 2 years;
- mowing height 5-15 cm;
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;
- obligation to remove or stack the cut biomass within no more than 2 weeks time after mowing (except justified cases);

Grazing: prohibited;
Fertilization: prohibited.

Amount of agri-environmental payment is 1,200 PLN/ha
Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Income lost on account of extensification of production	x	
2.	Income lost on fattened animals	x	
	Additional costs		
3.	Appropriate mowing technique	x	
4.	Removal or stacking the cut biomass	x	
Estimated balance of costs and benefits		1,391 PLN	
PROPOSED LEVEL OF PREMIUMS (86%)		**1,200 PLN/ha (307.4 EUR/ha)**	

1. income lost on account of extensification of production is calculated as a difference between the SGM for 2002 per 1ha of agricultural land and the SGM for 2002 per 1ha of agricultural land in extensive conditions – according to data of CSO and Agricultural Accountancy Department of IAFE between 2001 and 2003;
2. average density per 1 ha under extensive conditions x the Standard Gross Margin for 2002 for fattening based on the data of CSO and of the Agricultural Accountancy Department of IAFE for 2001-2003.
3. time needed for mowing x cost of mowing a specific area of a meadow according to data of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw);

4. this treatment requires the use of self-loading vehicle and a rake for a specific area of a meadow – according to data of IAFE NIB (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003., Koszty eksploatacji maszyn, IBMER, Warsaw);

Variant 4.3. – Tall sedge swamps

Variant 4.3 covers priority habitats of *Magnocaricion*, which are classified by Natura 2000 as Calcareous fens (7210) and tall sedge swamps, which are not listed as Natura 2000 habitats.
Phytosociological units: *Magnocaricion* community, excluding *Phalaridetum arundinaceae, Caricetum paniculatae*, *Cicuto-Caricetum pseudocyperi*, *Caricetum ripariae, Thelypteridi-Phragmitetum, Iridetum pseudacori.*

Description: Tall sedge swamps can be found within boggy and wet habitats. They are most frequently found within areas fed by fertile river waters, both on mineral soil (overflow wetlands areas) and organic soil ([pol.] bielawa). They may also be found within shallow standing water (marginal wetland) or running water. Tall sedge swamps are characteristic of considerably poor species composition, yet they play an important role in shaping faunistic values. They are breeding habitats of wetlands birds, including *Acrocephalus paludicola*, feeding areas for large herbivorous mammals and create favourable conditions for fish spawning. They also play an important role in retention of flood water and in natural filtration and treatment of surface waters. These functions, especially the ornithological function, are especially significant in the case of wide Caricetum. Tall sedge swamps are relatively common within the whole country area, especially in river valleys.
Within numerous areas, tall sedge swamps were traditionally mown once in several years, mainly for bedding for cattle, rarer for hay. These habitats were also used as pastures. Large sedge communities are threatened mainly by drainage thereof.

Requirements of Variant 4.3.:
<u>Mowing:</u>

- every year from 15 July to 30 September;
- 20% of area annually, where it should be another part every year; mowing of the whole area is allowed only once in 5 years;
- mowing height 5-15 cm;
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;

- obligation to remove or stack the cut biomass within no more than 2 weeks time after mowing (except justified cases);

Grazing:

- the maximum livestock density is 0.2 LU per ha, with maximum pasture load amounting to 2.5 t per ha (5 LU per ha);
- beginning of the grazing period in flooded areas no earlier than two weeks after the water recedes;
- ending date of the grazing period – 15 October.

Fertilization: prohibited.

The amount of agri-environmental payment is 1,200 PLN/ha
Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Income lost on account of extensive utilisation of a given habitat	x	
	Additional costs		
2.	Appropriate mowing technique	x	
3.	Purchase of additional fodder	x	
4.	Removal or stacking the cut biomass	x	
5.	Cost of leading the animals to the pasture	x	
	Additional income		
6.	Additional income on fattening animals		x
Estimated balance of costs and benefits		917.1 PLN	
PROPOSED LEVEL OF PREMIUMS (87%)		**800 PLN/ha (204.9 EUR/ha)**	

1. income lost on account of extensive utilization of a given habitat is calculated as a difference between the SGM for 2002 per 1ha of agricultural land and the SGM for 2002 per 1ha of agricultural land in extensive conditions – according to data of CSO and Agricultural Accountancy Department of IAFE between 2001 and 2003;
2. time needed for mowing x cost of mowing a specific area of a meadow according to data of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw);

3. amount of fodder in dt x price of fodder – according to data of the Agricultural Accountancy Department of IAFE for period 2001-2003 and data contained in Mały poradnik zarządzania gospodarstwem rolniczym 2002 rok, (joint publication, G. Niewęgłowska, ed.) , and according to the data of CSO and Fodder Market (joint publication, IAFE, Agricultural Market Agency, 2001-2003);
4. this treatment requires the use of self-loading vehicle and a rake for a specific area of a meadow– according to data of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw);
5. leading the animals to the pasture during the grazing season, i(number of days of grazing in a year x manhours per day x man-hour cost), based on the data of Institute for Land Reclamation and Grassland Farming in Falenty, CSO, Mały poradnik zarządzania gospodarstwem rolniczym, 2002;
6. Average density per 1 ha under extensive conditions x Standard Gross Margin for 2002 for fattening - based on the data of CSO and of the Agricultural Accountancy Department of IAFE for 2001-2003.

Variant 4.4. Litter meadows Molinion and Cnidion

Variant 4.4. covers habitats defined according to the Natura 2000 classification as Molinia meadows on calcareous, peaty or clayey-silt-laden soils (6410) and Alluvial meadows of river valleys of the Cnidion dubii (6440).

Phytosociological units: *Molinia caeruleae* communities (Molinia meadows) and *Cnidion dubii* communities (alluvial meadows) and referring communities, on which the presence of identifying species will be documented.

Description: Molinia meadows can be found mainly within habitats fed by shallow groundwater – on wet-ground forests (clayish substratum) or slightly drained peat bog ([pol] bielawa, proper moorshed meadows). Alluvial meadows, similar to Molinia meadows as regards species composition and manner of utilisation, are found first of all on fen soil in large river valleys. Molinia meadows and alluvial meadows, due to great species diversity and considerable regional variability, are among the most valuable semi-natural plant communities in Poland. They constitute a habitat of rare and protected plant species and butterflies, including those specified in Annex II to the Habitats Directive. The scope of occurrence of Molinia meadows covers the area of nearly the whole country. They usually take the form of small patches of flora. The alluvial meadows are located only along valleys of large rivers, mainly in the middle and partly lower reaches of Oder, Warta, Bug and Vistula.

Traditionally, they were mown once in several years, usually in autumn, for bedding. They were not fertilized. Autumn mowing facilitates the occurrence

of late-blossoming flowering plants and creates favourable conditions for the related butterflies.
The threat to the type of meadows in question is first of all the intensification of farming, resulting in the occurrence of meadows which are more valuable from the economic point of view, but far poorer from the natural perspective. Complete abandonment of utilisation leads to impoverishment of species. The threats also include leaving the mown biomass and the change of water relations (over-drainage and excessive boginess are equally unfavourable).

Requirements of Variant 4.4:

Mowing:

- every year between 15 September and 30 October;
- leaving 50% of unmown area annually, with the reservation that it is a different part every year; mowing of the whole area is allowed only once in 2 years;
- mowing height 5-15 cm;
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;
- obligation to remove or stack the cut biomass within the period not longer than 2 weeks after mowing (except justified cases);

Grazing: banned;
Fertilization: banned.

Amount of agri-environmental payment – PLN 1200 / ha
Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lost income because of the extensification of production	x	
2.	Income lost on fattened animals	x	
	Additional costs		
3.	Appropriate mowing technique	x	
4.	Removal or stacking the cut biomass	x	
Estimated balance of costs and benefits		1,390.5 PLN	
PROPOSED LEVEL OF PREMIUMS (86%)		**1,200 PLN/ha (307.4 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of UAA in 2002 and SGM for 2002 per 1ha of UAA under extensive conditions in 2002,

according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;

2. Lost income on fattened animals (average density per 1ha under extensive conditions x Standard Gross Margin for 2002 for fattening) based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for 2001-2003;
3. time needed for mowing x cost of mowing a specific area of a meadow - according to the Agricultural Accountancy Department of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003. *Koszty eksploatacji maszyn*, IBMER, Warsaw);
4. The operation requires a self-loading vehicle and ake on a specific area of a meadow according to the data of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);

Variant 4.5. Festuco-Brometea

Variant 4.5. covers habitats defined according to the Natura 2000 classification as:

- Koelerion glaucae (6120) - priority habitat;
- Festuco-Brometea (6210), where priority is set to stretches with significant orchid communities;
- Lowland hay meadows (6510-4);
- steppic grasslands, including Stipa tenacissima grasslands.

Phytosociological units: *Festuco-Brometea* class communities and *Koelerion glaucae* compound, as well as *Anthyllidi-Trifolietum montanii* community, and communities relating thereto, where the occurrence of identifying species is documented.

Description: Two groups of communities were joined here. They differ as to their species composition and distribution on the country area. The patches of communities are usually small and are considerably dispersed. They can be found in dry and sun-filled locations, on various types of soil, from sandy and gravel soil to soil with large calcium content. According to meadow typology, they are classified as impoverished oak-hornbeam forests. Festuco-Brometea and Koelerion glaucae are grasslands with species-richest plant associations in Poland. A number of plants occurring in those grasslands are classified as rare and endangered on the national scale, and also species of Annex II to the Habitats Directive. Festuco-Brometea are habitats for numerous invertebrates species, including the protected species, e.g. *Parnassius apollo* in Pieniny. Lowland hay meadows belong to the group of Koelerion glaucae and are endemic complexes of Pieniny, whereas Stipa tenacissima grasslands are of relic nature. Festuco-Brometea can be found within upland areas and sun-filled large river valley slopes and open, sandy upland areas in the lowlands.

Festuco-Brometea were to a great extent shaped as a result of extensive grazing (less often mowing). These communities are very sensitive to changes in habitat conditions. The negative changes in those communities result from abandonment of use as well as its intensification, i.e. fertilization and excessive grazing resulting in mechanical destruction of the ground cover. Due to the fast vanishing of those communities and related flora and fauna species, it is necessary to provide urgent, active protection through the promotion of extensive utilisation.

Requirements of Variant 4.5:

Grazing:

- the maximum livestock density is from 0.4 to 0.6 LSU per ha, with maximum pasture load amounting to 5 LSU/ha (2.5t/ha);
- the grazing season lasts from 1 May to 15 October in areas below 300 m above the sea level, or from 20 May to 1 October in areas higher than 300 m above the sea level;

Mowing:

- once a year between 15 July and 30 September;
- leaving 15-20% of unmown area annually, with the reservation that it is a different part every year;
- mowing height – up to 10 cm;
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;
- obligation to remove or stack the cut biomass within the period not longer than 2 weeks after mowing (except justified cases);

Fertilization: banned.

Amount of agri-environment payments – PLN 1200/ha

Payment calculation:

	Measures undertaken	Cost	Benefit
	Lost income		
1.	Lost income because of the extensification of production	x	
	Additional costs		
2.	Appropriate mowing technique	x	
3.	Purchase of additional fodder	x	
4.	Removal or stacking of cut biomass	x	
5.	Cost of leading the animals to the pasture	x	
	Additional income		
6.	Additional income on fattened animals		x
Estimated balance of costs and benefits		1,381 PLN	
PROPOSED LEVEL OF PREMIUMS (87%)		**1,200 PLN/ha (307.4 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of UAA in 2002 and SGM for 2002 per 1ha of UAA under extensive conditions in 2002, according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;
2. time needed for mowing x cost of mowing a specific area of a meadow- according to the Agricultural Accountancy Department of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);
3. amount of fodder in dt x price of fodderaccording to data of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003 and data contained in *Mały poradnik zarządzania gospodarstwem rolniczym 2002*, (joint publication, G. Niewęgłowska, ed.), and according to the data of CSO and Fodder Market (joint publication of 2001-2003, Institute of Agricultural and Food Economics, Agricultural Market Agency);
4. The operation requires a self-loading vehicle and a rake on a specific area of a meadow – according to the data of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);
5. Leading the animals to the pasture during the grazing season, (number of of grazing per year x number of manhours per day x man-hour cost) - based on the data of Institute for

Land Reclamation and Grassland Farming in Falenty, CSO, *Mały poradnik zarządzania gospodarstwem rolniczym*, 2002;

6. Average density per 1ha under extensive conditions x Standard Gross Margin for 2002 for fattening based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for 2001-2003.

Variant 4.6. Semi–natural wet meadows

Variant 4.5. covers eutrophic wet meadows, which are not on the list of Natura 2000 habitats.

Phytosociological units: *Calthion* communities and communities relating thereto, where the occurrence of identifying species is documented. Semi-natural wet meadows occur in various waterlogged habitats – on flooded river terraces (overflow wetlands areas), (pol.) podmokliska (wet-ground forests) or on slightly drained peat bogs (moorshed meadows).

Description: Semi-natural wet meadows are distinguished by rather great richness of flora. These communities are characteristic of rich fauna, including numerous rare species of wetlands birds. Wet meadows are breeding habitats for numerous species. Nests are usually built on the ground. For other bird species these meadows are rest and feeding areas during spring and autumn passages. These meadows also have important physiocenotic functions, e.g. in organic soil protection before mineralisation in the state of moderate drainage and surface waters retention. They are quite common within the whole country, within wet habitats, mainly in river valleys.

They are traditionally utilised as two-crop meadows (also grazed), usually fertilized, however the one-crop utilisation with the lack of fertilization has no negative impact on their floristic composition. The main threat is the intensification of utilisation resulting in the reduction of the plant and animal species composition. The negative changes in the communities also include leaving mown biomass and abandonment of utilisation.

Requirements of Variant 4.6:

<u>Mowing:</u>

- every year between 15 June and 30 September, not more than two mowings;
- leaving 5-10% of area unmown for the whole year, with the reservation that it is a different part every year;
- mowing height 5-15 cm;
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;

- obligation to remove or stack the cut biomass within the period not longer than 2 weeks after mowing (except justified cases);

Grazing:

- after 20 July, controlled open or quartered grazing with density up to 1 LU per ha and load of up to 10 LU per ha (5 t per ha) is allowed[15];
- the time for the beginning of the grazing period in flooded areas not earlier than two weeks after the water recedes;
- ending date of the grazing period – 15 October.

Fertilization:

- nitrogen fertilization allowed up to 60 kg/ha/year.

Amount of agri-environment payments - 800 PLN/ha
Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lost income because of the extensification of production	x	
	Additional costs		
2.	Appropriate mowing technique	x	
3.	Purchase of additional fodder	x	
4.	Removal or stacking of cut biomass	x	
5.	Cost of leading the animals to the pasture	x	
	Additional income		
6.	Additional income on animals		x
Estimated balance of costs and benefits		**849.5 PLN**	
PROPOSED LEVEL OF PREMIUMS (94%)		**800 PLN/ha (204.9 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of UAA in 2002 and SGM for 2002 per 1ha of UAA under extensive conditions in 2002,

[15] Pasture load is the number of animals at a given time at the pasture, while stocking density refers to the whole grazing season.

according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;

2. time needed for mowing x cost of mowing a specific area of a meadowaccording to the Agricultural Accountancy Department of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);
3. amount of fodder in dt x price – according to data of the Agricultural Accountancy Department of IAFE NRI for 2001-2003 and data contained in *Mały poradnik zarządzania gospodarstwem rolniczym, 2002* (joint publication, G. Niewęgłowska, ed.), and according to the data of CSO and Fodder Market (joint publication of 2001-2003, Institute of Agricultural and Food Economics, Agricultural Market Agency);
4. The operation requires a self-loading vehicle and a rake on a specific area of a meadow– according to the data of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);
5. Leading the animals to the pasture during the grazing season (number of grazing daysper year x number of manhours per day x man-hour cost)based on the data of Institute for Land Reclamation and Grassland Farming in Falenty, CSO, *Mały poradnik zarządzania gospodarstwem rolniczym*, 2002;
6. Average density per 1ha under extensive conditions x Standard Gross Margin for 2002 for fattening based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003.

Variant 4.7. – Semi–natural mesic meadows

Variant 4.7. covers habitats defined according to the Natura 2000 classification as part of low and mountain fresh meadows used extensively (6510, without 6510-4, i.e. lowland hay meadows) and trisetum mountain hay meadows used extensively (6520).
Phytosociological units: communities of *Arrhenatherion* compounds (except for *Poo-Festucetum* forma and dry *Anthyllidi-Trifolietum montanii* meadows) and *Polygono-Trisetion*, as well as communities relating thereto, where the occurrence of identifying species is documented.

Description: Semi-natural fresh meadows occur in mineral upland areas and river valley slopes, as well as in the neighbourhood of rivers in light fen soils, i.e. habitats classified in meadow typology as proper wet meadows and moistened wet meadows as well as partly dried meadows. These are habitats most beneficial for agricultural use, therefore meadows growing thereon are mainly utilized intensively. This has lead to the impoverishment of their species-content and loss of natural value. Semi–natural mesic meadows are characterized by large species-richness and significant landscape value. Ryegrass meadows and species-rich bluegrass meadows (*Arrhenatherion*) occur in lowland areas of Poland, and gladiolus and bent grass meadows or trisetum hay grass meadows (*Polygono-Trisetion*) in the stretch of lower nappe of Western Carpathians, especially Tatra mountains.

Semi-natural fresh meadows are used mainly as two-crop meadows and constitute valuable economically permanent pastures. Intensification of use (intensive grazing, soil hardening, low mowing), as well as ending the utilisation or lack of fertilization lead to the impoverishment of species-richness of communities.

Requirements of variant 4.7:

Mowing:

- every year between 15 June and 30 September; after 15 July second mowing is allowed or controlled grazing;
- leaving 5-10% of area unmown for the whole year, with the reservation that it is a different part every year;
- mowing height – 5-15 cm;
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;
- obligation to remove or stack the cut biomass within the period not longer than 2 weeks after mowing (except justified cases);

Grazing:

- the maximum livestock density is from up to 1 LSU per ha, with maximum pasture load amounting to 10 LSU/ha (5t/ha)[16];
- the time for the beginning of the grazing period in flooded areas not earlier than two weeks after the water recedes;
- ending date of the grazing period – 15 October.

Fertilization:

- nitrogen fertilization allowed up to 60 kg/ha/year.

[16] Pasture load is the number of animals at a given time at the pasture, while stocking density refers to the whole grazing season.

Amount of agri-environment payments - 800 PLN/ha
Payment calculation:

	Measures undertaken	Cost	Benefit
	Lost income		
1.	Lost income because of the extensification of production	x	
	Additional costs		
2.	Appropriate mowing technique	x	
3.	Purchase of additional fodder	x	
4.	Removal or stacking of cut biomass	x	
5.	Cost of leading the animals to the pasture	x	
6.	Additional income on animals		x
Estimated balance of costs and benefits		**849.5 PLN**	
PROPOSED LEVEL OF PREMIUMS (94%)		**800 PLN/ha (204.9 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of UAA in 2002 and SGM for 2002 per 1ha of UAA under extensive conditions in 2002, according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;
2. time needed for mowing x cost of mowing a specific area of a meadowaccording to the Agricultural Accountancy Department of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);
3. amount of fodder in dt x price – according to data of the Agricultural Accountancy Department of IAFE NRI for 2001-2003 and data contained in *Mały poradnik zarządzania gospodarstwem rolniczym* 2002 (joint publication, G. Niewęgłowska, ed.), and according to the data of CSO and Fodder Market (joint publication of 2001-2003, Institute of Agricultural and Food Economics, Agricultural Market Agency);
4. The operation requires a self-loading vehicle and a rake on a specific area of a meadow – according to the data of IAFE NRI (Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003*) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A., 2001-2003., *Koszty eksploatacji maszyn*, IBMER, Warsaw);
5. Leading the animals to the pasture during the grazing season(number of grazing days per year x number of manhours per day x man-hour cost) based on the data of Institute for Land Reclamation and Grassland Farming in Falenty, CSO, *Mały poradnik zarządzania gospodarstwem rolniczym*, 2002;

6. Average density per 1ha under extensive conditions x the Standard Gross Margin for 2002 for fattening based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003.

Variant 4.8.– Species-rich Nardion grasslands

Variant 4.8 covers habitats defined according to the Natura 2000 classification as Species-rich Nardus grasslands, on silicious substrates in mountain areas (6230), where priority is put only to species-rich stripes.
Phytosociological units: *Nardetalia* communities and communities relating thereto, where the occurrence of identifying species is documented.

Description: Nardion grasslands develop on semi-humid soil, acidifies, dystrophic, Alpine ranker-type or Sub-Alpine podzoline ranker type with a layer of humus, and on mineral and fen soils. High quality of Nardion grasslands result mainly from the limited range of their occurrence (e.g. East-Carpathian high-mountain pasture Nardus grassland is considered an endemic community for East Carpathians). Taking the solution from the list of priority habitats of the EU Habitats Directive, naturally valuable are those habitats of Nardus grasslands, which contain a large number of rare species, including orchids. Nardion grasslands occur in the territory of the whole country, and their species-rich variants are located mainly in mountain and highland areas, and less often on the slopes of river valleys (habitats of impoverished oak-hornbeam forests) especially in northern Poland.
Species-rich Nardion grasslands are communities traditionally utilized as extensive grazing land. Too high intensity of grazing leads to intensive impoverishment of these communities and taking over by mat-bent. The main threat lies in the seizure of their utilization – unutilised Nardus grasslands are covered by bushes in a relatively short period of time.

Requirements of variant 4.8:
Grazing:

- the livestock density of 0.4-0.6 LU per ha, with maximum pasture load amounting to 5 LU/ha (2.5 t/ha);
- the time for the beginning of the grazing period in flooded areas not earlier than two weeks after the water recedes;
- the grazing season lasts from 1 May to 15 October in areas below 300 m above the sea level, or from 20 May to 1 October in areas higher than 300 m above the sea level;

Fertilization: banned.

Amount of agri-environmental payment – PLN 800 / ha
Payment calculation:

	Measures undertaken	Cost	Benefit
	Lost income		
1.	Lost income because of the extensification of production	x	
	Additional costs		
2.	Purchase of additional fodder	x	
3.	Cost of leading the animals to the pasture	x	
	Additional income		
4.	Additional income on animals		x
Estimated balance of costs and benefits		879.8 PLN	
PROPOSED LEVEL OF PREMIUMS (91%%)		**800 PLN/ha (204.9 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of agricultural land in 2002 and SGM for 2002 per 1ha of agricultural land under extensive conditions in 2002, according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;
2. amount of fodder in dt x price of fodder – according to data of the Agricultural Accountancy Department of IAFE NRI for 2001-2003 and data contained in *Mały poradnik zarządzania gospodarstwem rolniczym 2002*, joint publication, G. Niewęgłowska (ed.), and according to the data of CSO and Fodder Market, joint publication of 2001-2003, Institute of Agricultural and Food Economics, Agricultural Market Agency;
3. Leading the animals to the pasture during the grazing season (number of grazing days per year x number of manhours per day x man-hour cost) based on the data of Institute for Land Reclamation and Grassland Farming in Falenty, CSO, *Mały poradnik zarządzania gospodarstwem rolniczym*, 2002;
4. Average density per ha under extensive conditions x the Standard Gross Margin for 2002 for fattening - based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003.

Variant 4.9 - Salt marshes

Variant 4.8 covers habitats defined according to the Natura 2000 classification as:

- inland salt meadows with Glasswort (1310);
- seaside salt flats (1330);
- inland salt meadows, pastures and swards (1340) as a priority habitat.

Phytosociological units: communities of *Asteretea tripolium* and *Thero-Salicornietea* class, *Potentillo-Festucetum* set (*Molinio-Arrhenatheretea* class) and *Scripetum maritimi* (*Phragmitetea* class) and corresponding communities, where the presence of identifying species is proven in accordance with definitions of Natura 2000 habitats.

Description: These communities occur near salty and semi-salty surface and ground waters. They contain a series of highly specialised, rare species characteristic for salty habitats. These include rare biocenoses, occurring mainly at the seashores and spread in valleys of large lowland rivers.
Salt marshes were utilized for extensive grazing and mowing. They may be threatened by seizing utilization, overgrazing and sweetening of feeding waters (especially in the case of inland salt flats).

Requirements for variant 4.9:
Grazing:

- the livestock density of 0.5 to 1 LU/ha;
- in the case of inventive occurrence of reed, quartered grazing should be applied which should start with quarters of high reed intensity and gradually turn into typically salty meadows.

Mowing:

- instead of grazing, once per year, not earlier than on 1 July, with the possibility of leaving the cover not mown once every 5 years;
- not earlier than two weeks after flood water recedes;
- mowing height 5-15 cm;
- obligation to remove the cut biomass within the period not longer than 2 weeks after mowing (except justified cases);
- mowing technique: in a manner preventing the destruction of the plant and soil structure, ban on circular mowing from the outside to the inside of an agricultural parcel;

Fertilization: banned.

Amount of agri-environmental payment – PLN 1190 / ha
Payment calculation:

	Measures undertaken	Cost	Benefit
	Lost income		
1.	Lost income because of the extensification of production	x	
	Additional costs		
2.	Purchase of additional fodder	x	
3.	Cost of leading the animals to the pasture	x	
	Additional income		
4.	Additional income on animals		x
Estimated balance of costs and benefits		1,195 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**1,190 PLN/ha (304.8 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of agricultural land in 2002 and SGM for 2002 per 1ha of agricultural land under extensive conditions in 2002, according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;
2. amount of fodder in dt x price of fodder – according to data of the Agricultural Accountancy Department of IAFE NRI for 2001-2003 and data contained in *Mały poradnik zarządzania gospodarstwem rolniczym 2002*, joint publication, G. Niewęgłowska (ed.), and according to the data of CSO and Fodder Market, joint publication of 2001-2003, Institute of Agricultural and Food Economics, Agricultural Market Agency;
3. Leading the animals to the pasture during the grazing season, (number of grazing days per year x number of manhours per day x man-hour cost) based on the data of Institute for Land Reclamation and Grassland Farming in Falenty, CSO, *Mały poradnik zarządzania gospodarstwem rolniczym*, 2002;
4. Average density per ha under extensive conditions x the Standard Gross Margin for 2002 for fattening - based on the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for 2001-2003.

Variant 4.10: Natural lands

This variant covers habitats defined according to the Natura 2000 classification as:

- raised bogs (7110, 7120);
- some transition mires and quaking bogs (7140);
- depressions on peat substrates (7150);

- some alkaline fens (7230);
- dune grasslands (2330);
- heaths (4030, 4010);
- rushes (including 7210).

Description: Natural lands may often be encountered in the form of enclaves in agricultural landscapes. They contribute to the increase in biodiversity and are home to many protected, rare and endangered plant and animal species. Moreover, peat bogs play a vital role in water retention, whereas dune grasslands prevent wind erosion.
For wetland habitats, drainage constitutes one of the major threats. Dune grasslands and bogs are threatened by the extraction of peat or sand, as well as afforestation.

Requirements for variant 4.10:

- minimum area of natural land – 0.1 ha; support is granted for 5 ha of natural lands per one agricultural holding;
- maintenance of natural land in the state not worsened, in accordance with the recommendations of the agri-environmental advisor, e.g. in the case of peat bogs – ban on drainage, turf extraction; in the case of dune grasslands – ban on sand extraction; in the case of large-tuft beds – ban on drainage, maintenance of tufts;
- non-application of fertilizers and plant protection products;
- removal of waste from the area covered by natural land;
- application of any treatment ordered or advised by agri-environmental advisor;
- undertaking agricultural activity in accordance with the recommendations of the agri-environmental advisor (e.g. collection of herb raw materials, extensive grazing on grasslands).

Amount of agri-environment payments – PLN 550/ha
Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lost income because of the extensification of production	x	
	Additional costs		

2.	Difficult cultivation in the edge of natural land	x	
3.	Treatment	x	
Estimated balance of costs and benefits		551 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**550 PLN/ha (140.9 EUR/ha)**	

1. Income lost due to extensive production is equal to the result of subtraction of SGM per 1ha of agricultural land in 2002 and SGM for 2002 per 1ha of agricultural land under extensive conditions in 2002, according to the data of CSO and of the Agricultural Accountancy Department of IAFE NRI for period 2001-2003;
2. Difficult cultivation in the edge of a natural land in relation to higher amount of man-hours and fuel consumption - according to the data of Institute for Building, Mechanisation and Electrification of Agriculture concerning cost of machinery (Muzalewski A., 2001-2003. *Koszty eksploatacji maszyn*. IBMER, Warszawa), Klementowski A., *Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003* and data of Institute for Land Reclamation and Grassland Farming in Falenty;
3. Treatment, including litter removal (time in MH x man-hour cost) according to the data of CSO, Institute for Land Reclamation and Grassland Farming in Falenty, Warsaw Agricultural University and Mały poradnik zarządzania gospodarstwem rolniczym, 2002.

Package 5. Protection of endangered bird species and natural habitats in Natura 2000 areas

Scope, requirements and calculation of payments are the same as for Package 4 Protection of endangered bird species and habitats outside of Natura 2000 sites, but agri-environmental payments fully compensate (100% of calculation of payments) income foregone and additional cost.

Level of aid for package Protection of endangered bird species and habitats under Natura 2000 sites

Variant 5.1. Protection of bird breeding habitats 1,370 PLN/ha (350.9 EUR/ha)

Variant 5.2. Small sedge-moss communities 1,390 PLN/ha (356.1 EUR/ha)

Variant 5.3. Tall sedge swamps 910 PLN/ha (233.1 EUR/ha)

Variant 5.4. Litter meadows Molinion and Cnidion	1,390 PLN/ha (356.1 EUR/ha)
Variant 5.5. Festuco-Brometea	1,380 PLN/ha (353.5 EUR/ha)
Variant 5.6. Semi–natural wet meadows	840 PLN/ha (215.2 EUR/ha)
Variant 5.7. Semi–natural mesic meadows	840 PLN/ha (215.2 EUR/ha)
Variant 5.8. Species-rich Nardion grasslands	870 PLN/ha (222.8 EUR/ha)
Variant 5.9. Salt marshes	1,190 PLN/ha (304.8 EUR/ha)
Variant 5.10. Natural land	550 PLN/ha (140.9 EUR/ha)

Package 6. Preservation of endangered genetic plant resources in agriculture[17]

Variant 6.1. Local crop varieties commercial production
Variant 6.2. Seed production of local crop varieties
Variant 6.3. Seed production at the request of the gene bank
Variant 5.4. Traditional orchards

Description: The variants as described in the package are compliant with Common Agricultural Policy objectives, and in particular with Directive 870/2004 (Conservation and Utilisation of Genetic Resources) and FAO Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (GPA) adopted by the European Union (Leipzig, 1994).

Package 6. Preservation of endangered genetic plant resources in agriculture is compliant with:
- Council Decision of 25 October 1993 concerning the approval of the Convention on Biological Diversity,

[17] According to Article 39 (5) of Council Regulation 1698/2005 all variants within his package fall into *insitu* protection.

- Council Decision 2004/869/EC of 24 February 2004 on the approval of the International Treaty on Genetic Resources for Food and Agriculture in the name of the European Community,
- Council Regulation (EC) No 870/2004 of 24 April 2004 establishing a Community programme on the conservation, characterisation, collection and utilisation of genetic resources in agriculture and repealing Regulation 1467/94/EC.

The package provides an opportunity of supporting farmers who actively participate in protection and improvement of local[18] or old varieties of crop species, as well as of presently endangered crop species and accompanying species.

The package provides an opportunity of maintaining the existing genetic resources of crop plants by farmers and practical utilization of best genotypes available in gene banks.

Farmers who cultivate local crops varieties in a traditional way are entitled to receive an agri-environmental payment. The proposed amount of agri-environmental payment is the same for different kinds of crops (cereals, root plants, vegetables). Payment diversification depends on whether the crops are market plants or seed plants, and within seed cultivation – on whether the seed production is intended for market or for gene bank. The minimal unpaid cultivation also varies according to particular type of action. This is to compensate for the differences between various types of crops.

Objective: preservation of local crop varieties

Variant 6.1. Local crop varieties commercial production

Description: The maintenance of local crop varieties, which will increase the diversity of species and varieties of agricultural crops will be the result of implementation of this variant.

Requirements of Variant 6.1.:

- minimum total area of agricultural crops – 0.3 ha, for vegetable crops – 0.15 ha;
- cultivation of plants from certified seed material of local varieties registered in National Register upon first and fourth propagation and exchange of seed material;

[18]Local variety (cultivar) means a group of plants within a species evolved as a result of long-lasting impact of local environmental and agricultural factors, not as a result of breeding activity (The Seed Act of 26 June 2003, Journal of Laws [Dziennik Ustaw] No 92, item 639.)

- cultivation of other plant species, which do not require registration, according to the annex to ordinance of minister relevant for agriculture.

There is an obligation to maintain the areas of permanent grassland and elements of the landscape which are not used for agricultural purposes within the whole area of the agricultural holding.

Amount of agri-environmental payment – PLN 570/ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lost Standard Gross Margin	x	
2.	Variety purity and identity control	x	
Estimated balance of costs and benefits		570 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**570 PLN/ha (146 EUR/ha)**	

1. Lower standard gross margin in relation to standard crop (SGM for 2002 per 1 ha of UAA x % volume of SGM lost) - on the basis of CSO data, data of Agricultural Accountancy Department of Institute of Agricultiure and Food Economics National Research Institute (IAFENRI) and data from *Mały poradnik zarządzania gospodarstwem rolniczym*, 2002, joint publication, G. Niewęgłowska, ed.;
2. Cost of control of variety purity and identity – data from Cultivation-Research Station of Institute of Plant cultivation and Acclimatization from 2001-2003

Variant 6.2. Seed production of local crop varieties

The result of implementation of this variant will be the achievement of greater availability of local crop varieties seed material as well as their dissemination. The statutory duty of seed material certification rests with the producers, who produce seeds of varieties subject to registration. Seed material of other varieties enumerated in the annex to ordinance of minister relevant for agriculture is not subject to certification. Duties equal to those which apply to other seed producers shall also apply to any farmer producing seed material of local variety which is entered into the National Register, who applies for financial support.

This variant is in line with Community legislation regulating the trade of seed material of crop plants, i.e. Directive 66/401/EEC, 66/402/EEC, 2002/53/EC,

2002/54/EC, 2002/57/EC and Council Directive 2002/55/EC of 13 June 2002 on the trade of seed material of vegetables and draft Commission Directive establishing an exception, which allows to trade with seed material and planting material of local varieties and varieties adapted to local conditions under threat of genetic erosion.

Requirements of Variant 6.2.:

- maintenance of variety purity and identity;
- keeping the documentation of data concerning plantation and performed treatment and making it available to control authorities (State Plant Health and Seed Inspection);
- obtaining the certificate of laboratory analysis in the case of registered species, and in the case of other species – information on the results of research.

In the case of production of seed material of "certified" category, the area of agricultural plants'[19] seed plantations shall not be smaller than:

1) 2 ha in the case of seed material of cereals;
2) 1 ha in the case of seed material of potatoes;
3) 0.5 ha in the case of seed material of other agricultural plants.

There is an obligation to maintain the areas of permanent grassland and elements of the landscape which are not used for agricultural purposes within the whole area of the agricultural holding.

Amount of agri-environmental payment – PLN 800/ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lost Standard Gross Margin	x	
	Additional costs		
2.	Higher costs of elite seed material	x	
3.	Higher labour cost – by 100 working hours per hectare	x	
4.	Field and laboratory qualification (germination power, diseases, purity)	x	
	Savings		
5.	Greater income related to seed material production		x

[19] The Seed Act of 26 June 2003 (Journal of Laws [Dziennik Ustaw] No 92, item 639

Estimated balance of costs and benefits	1,024 PLN
PROPOSED LEVEL OF PREMIUMS (78%)	**800 PLN/ha (204.9 EUR/ha)**

1. Lower standard gross margin in relation to standard crop (SGM for 2002 per 1 ha of UAA x % volume of SGM lost) - on the basis of CSO data, data of Agricultural Accountancy Department of Institute of Agricultiure and Food Economics National Research Institute (IAFENRI) and data from Mały poradnik zarządzania gospodarstwem rolniczym, 2002, joint publication, G. Niewęgłowska, ed.;
2. Cost related to the purchase of "elite" seed material higher – on the basis of data from Cultivation-Research Station of Institute of Plant cultivation and Acclimatization from 2001-2003, data from CSO;
3. Additional cost related to higher work load, (number of manhours x cost of manhour per hectare) – on the basis of data of Cultivation-Research Station of Institute of Plant Cultivation and Acclimatization from 2001-2003, data from CSO;
4. Cost of conduction of field and laboratory qualification - on the basis of data from Cultivation-Research Station of Institute of Plant Cultivation and Acclimatization from 2001-2003, data from CSO;
5. 40% higher Standard Gross Margin as the result of seeds production (SGM for 2002 per 1 ha of UAA x % volume of SGM increased) data from Institute of Plant Cultivation and Acclimatization and data from CSO for years 2001-2003.

Variant 6.3. Seed production at the request of gene bank

Description: Implementation of the variant will concern propagation and maintenance of:
- - local crop varieties
- endangered crop species;
- endangered species of plants that accompany them in their natural habitats, in order to preserve their original properties.

Requirements of Variant 6.3.:

- contract with gene bank for seed propagation (farmer provides seed to the gene bank free of charge) along with plan of variant implementation;
- minimum total area for crops contracted by a gene bank is 0.1 ha and a maximum area is 0.3 ha; seed production on small area requires the maintenance of particular isolation principles. 50% of area covered by the payment consist of propagation crops; the remaining area consists of buffer zone – area sown with other species, black fallow or mowed

grass, depending on the kind of propagated species; the type of buffer zone is defined in a contract concluded with gene bank;
- keeping crop documentation and making it available to employee of gene bank supervising the crop;
- confirmation of required seed quality by a gene bank.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment - PLN 4,700 per ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lost Standard Gross Margin	x	
	Additional costs		
2.	Higher labour cost – by 350 working hours per hectare*8.5 PLN	x	
3.	Keeping crop documentation 8h*2 days*8.5 PLN	x	
4.	Field and laboratory qualification (germination rate, diseases, purity)	x	
Estimated balance of costs and benefits		4,711 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		4,700 **PLN/ha** **(1,204 EUR/ha)**	

1. Foregone standard gross margin (all seeds produced by framers are provided to gene bank, free of charge);
2. Additional cost related to higher work load by 350 working hours (number of manhours x cost of manhour) – according to data of Cultivation-Research Station of Institute of Plan Cultivation and Acclimatization from 2001-2003, data CSO;
3. Time needed for keeping crop documentation (number of days x number of hours x cost of 1 manhour) –according to data from Cultivation-Research Station of Institute of Plan Cultivation and Acclimatization, data CSO from 2001-2003
4. Cost of conducting field and laboratory qualification - on the basis of data from Cultivation-Research Station of Institute of Plan Cultivation and Acclimatization from 2001-2003, data CSO;

Variant 6.4. Traditional orchards

Description: Agri – environmental payment is defined on the basis of area occupied directly by orchards which cannot be less than 0.1 ha and more than 0.4 ha with a number of trees meeting the appropriate quality and quantity criteria. n the case of traditional orchards larger than 0.4 ha, agri-environmental payment shall be granted only for the area specified as maximum area (0.4 ha).

Requirements of Variant 6.4.:

- varieties contained in a list – annex to ordinance of minister competent for agriculture – are grown in a traditional orchard and constitute at least 60% of total number of trees (stock);
- traditional orchard consists of at least 12 trees 15-20 years old, which represent not less than 4 varieties or species, while lowest parts of canopies are at the height of at least 120 cm; trunk diameter cannot be lower than 15 cm at the height of about 1 meter;
- if the above conditions are fulfilled, an orchard may be supplemented with up to 40% of total tree number with varieties from the list; increase requires the increase on the number of cultivars/species by at least three cultivars/species; Trees are propagated on strong-growing rootstocks (e.g. apple trees on „Antonowka" seedlings, pear trees on caucasian pear seedlings, prunes on cherry prune seedlings, cherries on bird cherry seedlings, sour cherries on bird cherry) implemented as high trees of the minimum trunk height amounting to 1.20 m with spacing of not less than 4 x 6 m and not more than 10 x 10 m;
- the following maintenance measures are mandatory: sanitary pruning and clearance pruning in order to make the canopy lighter, removal of offshoots and self-seeding plants, bleaching the older tree trunks and protecting younger trees against rodents and rabbits, maintaining general order;
- grass mowing and removal or grazing.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment - PLN 2,100 per ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	15% of yield value loss	x	
	Additional costs		
2.	Grass mowing and biomass removal	x	
3.	Tree pruning (half of orchard each year)	x	
Estimated balance of costs and benefits		2,430 PLN	
PROPOSED LEVEL OF PREMIUMS (86%)		**2,100 PLN/ha (537.9 EUR/ha)**	

1. % loss of yield value (average yield valuex yield value loss) – on the basis data from Department of Horticulture Economics IBMEA, CSO, Mały poradnik zarządzania gospodarstwem rolniczym, 2002, ed. G. Niewęgłowska;

2. Cost of sward moving and biomass removal (number of manhours x cost of 1 manhour) – on the basis of data from Department of Horticulture Economics IBMEA and Institute of Pomology and Floriculture n Skierniewice;
3. Cost of trimming in 2 years distance - on the basis of data of Department of Horticulture Economics IBMEA and Institute of Pomology and Floriculture n Skierniewice.

Evidence of genetic erosion threat for plant genetic resources

Polish agriculture constitutes a specific case in Central Europe. This is due to its fragmentation which resulted in preservation of local crop varieties until nowadays. Most areas with local crop material are located mostly in southern part of Poland. They cover mountainous regions of Beskidy and Tatry and Pogórze. Smaller refugia have been found in eastern and south-eastern Poland in Podlasie region and Kotlina Sandomierska basin. Typical features of these regions are difficult climate conditions, short vegetation period and rolling landscape. Geographic, ecological and sociological factors of these regions are favourable for local crop varieties (geographical insulation, unfavorable conditions for mechanical land management). On the other hand, it is necessary to emphasise that the local varieties successfully compete with new varieties in these regions. Well-adapted to local environment conditions, they ensured rather low but sustainable yield in years of crop failure.

At present, local crop varieties are available mostly in form of materials stored in gene bank. It is estimated that within recent 10 years many populations of local crop varieties have almost completely vanished. There are, however, some preserved cultivation areas, where it is still possible to find local varieties of vegetables, orchard and ornamental plants as well as herbs.

Package 7. Maintenance of genetic resources of endangered animal species in agriculture [20]

Variant 7.1. Preservation of local cattle breeds
Variant 7.2. Preservation of local horse breeds
Variant 7.3. Preservation of local sheep breeds
Variant 7.4. Preservation of local pig breeds

Description: The package is designed in order to protect particularly valuable farm animal breeds, the low number of which threatens their existence. Farm animals' genetic resources in Poland are under protection pursuant to Article 21(a) of the Act of 20 August 1997 on the organization of

[20] According to the Article 39 paragraph 5 of the Council Regulation 1698/2005 all variants of this package are included in *insitu* protection.

breeding and reproduction of farm animals (consolidated text Dz.U. 02.207.1762 as amended).
Local cattle breeds are perfectly adapted to local conditions, which often are very difficult. They can be kept under extensive production conditions and on scarce fodder resources. Their products are often of unique quality. Maintenance of the animals makes it possible to manage such areas, which otherwise would not be managed at all. They are also of great significance because of role played by them in the history of their region of origin and are linked with tradition and culture of local communities.
The package is divided into variants according to animal species.

Objective: Preservation of domestic animal breeds

Variant 7.1. Preservation of local cattle breeds

Description: Local cattle breeds are perfectly adapted to local conditions, which often are very difficult. They need to be preserved and promoted, particularly within extensive production systems of organic farming and agro-tourism, where they play also non-productive role – in particular in education. Local cattle breeds should be popularised with particular emphasis on areas where tradition of their breeding still exists.
The package covers bovine breeds, for which breeding programmes for genetic resources protection are implemented: Polish Red, Whitebacked (Białogrzbieta), Polish Red-and-White Lowland, Polish Black-and-White Lowland.
Polish Red and Whitebacked cattle are old Polish domestic races with the characteristics of autochthonic populations, such as: ideal adaptation to difficult environmental conditions, highly tolerant as regards fodder, ability to decrease productivity which allows to endure seasonal fodder deficiencies as well as ability of relatively fast regeneration. Polish red and white cattle is characterised by clearly bi-directional use, durability, good health and longevity, good fertility, easy births and good calf rearing. It is well adapted to be kept in farms with permanent grasslands.
Polish black-and-white cattle has been used historically in milk and meat direction. It is distinguished by the following features: good milk productivity, high resistance to diseases and healthiness, high liveliness of calves, easy calf rearing, good fertility, easy births and ideal adaptation to difficult environmental conditions.

Requirements of Variant 7.1.:

- minimum number of females in a herd: 4 cows of the same breed qualified for participation in a protection programme;
- entering cows into register of breeding animals of a particular breed;

- carrying out milk utility evaluation and breeding documentation in the herd;
- implementation of a breeding programme for protection of genetic resources of a particular bovine breed;

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environment payment – PLN 1,140/animal
Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Additional cost		
1.	Keeping breeding documentation	x	
	Lost income		
2.	Lost Standard Gross Margin	x	
Estimated balance of costs and benefits		1,142 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**1,140 PLN/unit (292 EUR/unit)**	

1. Cost of keeping breeding documentation for cattle in accordance with the price-list of the entity keeping herdbooks and performance evaluation - according to the National Center for Livestock Breeding;
2. Lost Standard Gross Margin cause of lower productivity of indigenous cattle breed in relation to high-milk yielding breed (LU value x SGM per 1 ha of UAA) – (own evaluation on the basis of Book of cattle performance inspection and according to the Agricultural Accountancy Department of IAFE NRI and CSO).

Variant 7.2. Preservation of local horse breeds

Description: Local farm horse breeds are perfectly adapted to local conditions, which often are very difficult. They are characterized by the following features: **high resistance to diseases, high fertility and good fecundity and female features, longevity and adaptive abilities as regards extreme environmental conditions and low-quality fodder. Local horse breeds need to be preserved and promoted within extensive production systems of organic farming and agro-tourism, where they play also non-productive role – particularly in education.**

The package covers horse breeds, for which breeding programmes for genetic resources protection are implemented: Polish horse (Konik), Hucul Horse, Małopolski Horse, Śląski Horse, Wielkopolski Horse, Sokólski Horse and Sztumski Horse.

Polish horse is a typical representative of polish little horses. It originates directly from wild horses – tarpans.

Hucul horses are one of the oldest breeds described in Poland. They have been developed (bred) in eastern Carpathians, in severe climate of mountains.

Małopolski Horse has a genotype and phenotype which emphasis the separate and specific features of Polish Anglo-Arab horse.

Ślaski horse originates from local noble mares and Oldenburg and East-Frisian stallions.

Wielkopolski horse was created as a result of improving local stock with East Prussian and Trakehner breeds.

Sokólski horse was created at the end of XIX century in the areas of Vilnius, Grodno and Białystok as a result of crossing local mares with cold-blooded stallions.

Sztumski Horse was created at the beginning of XX century as a result of crossing local horses from Żuławy lowland with Belgian and Rhine-Belgian stallions.

Requirements of Variant 7.2.:

- minimum number of females in a herd: 2 mares of the same breed qualified for participation in a protection programme;
- entering horses into register of breeding animals of a particular breed and maintaining herdbooks;
- implementation of a breeding programme for protection of genetic resources of a particular horse breed.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environment payments – 1,500 PLN/animal

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Additional cost		
1.	Reproduction cost	x	
2.	Preparation of pasture (isolation of plots with electric fence)	x	

3.	Preparation to performance tests	x	
4.	Keeping breeding documentation	x	
	Lost income		
5.	Lost Standard Gross Margin	x	
	Additional income		
6.	Revenue from sale of foal		x
7.	Revenue from recreation rides		x
Estimated balance of costs and benefits		1,503 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**1,500 PLN/unit (384.2 EUR/unit)**	

1. Reproduction cost, including cost of delivery of mare to stallion (distance in km x cost of travel and average price for covering by programme's stallion) – according to the Polish Union of Horse Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003) and CSO;
2. Cost of preparation of pasture by isolation of plots with electric fence - according to the Polish Union of Horse Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003) and CSO;
3. Cost of preparation to performance tests - according to the Polish Union of Horse Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003) and CSO;
4. Cost of keeping breeding documentation for horses in accordance with the price-list of the entity keeping herdbooks and performance evaluation - according to the Polish Union of Horse Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003) and CSO;
5. Lost Standard Gross Margin (LU value x SGM per 1 ha of UAA) - according to the CSO and Agricultural Accountancy Department of IAFE NRI;
6. Revenue from sale of foal - according to the Polish Union of Horse Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003) and CSO;
7. Revenue from recreation rides - according to the Polish Union of Horse Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003) and CSO.

Variant 7.3. Preservation of local sheep breeds

Description: Implementation of this package is aimed to preserve genetic diversity of local ovine breeds and breeds created in the territory of Poland, well adapted to the local environmental conditions and maintenance systems. The package covers ovine breeds, for which breeding programmes for genetic resources protection are implemented: wrzosówka, świniarka, olkuska, naturally coloured Polish mountain sheep (polska owca górska odmiany barwnej), naturally coloured merino (merynos odmiany barwnej), polish lowland sheep of the Uhruska variety (owca nizinna odmiany uhruskiej), wielkopolska, polish lowland sheep of the Żelaźnieńska variety (polska owca nizinna odmiany żelaźnieńskiej), korideil, kamieniecka,

pomorska, cakiel podhalański and old-type polish merino (merynos polski w starym typie).
Local primitive ovine breeds (cakiel podhalański, świniarka, wrzosówka) played a vital role in shaping later noble regional sheep breeds; merynos of the old type is a progenitor of the merinos sheep type characterised by wool of excellent quality. A characteristic feature of local ovine breeds is that they are well adapted to local environmental conditions, have minimum feeding requirements and are to a large extent resistant to diseases and unfavorable living conditions. These features confirm the justifiability of work to restore the due position in the ecosystem to the above mentioned ovine breeds - using them for grazing aimed at preservation of the values of the environment and as an important element of rural folklore. The Polish mountain sheep is an inherent element of the economy, tradition and culture of highlanders. Sheep grazing in permanent grassland has a very favourable influence on landscape shaping and nurturing, especially in poor biotopes such as mountain areas, lakeland and river valleys. Sheep play also a vital role in farm tourism, as they are an important element of landscape and provide specific products, i.e. oscypek (smoked ewe's milk cheese made in the Tatra Mountains) (Polish mountain sheep), sheepskin coat (sheep of the wrzosówka breed), naturally coloured wool (naturally coloured polish merino, naturally coloured Polish mountain sheep). Moreover, sheep in an agricultural holding are an additional tourist attraction.

Requirements of Variant 7.3.:

- minimum number of nanny-sheep of the same breed qualified for participation in a protection programme:
  - 5 ovine animals of the Olkuska breed;
  - 10 ovine animals of other breeds;
- entry into register of breeding animals of a given breed and keeping breeding documentation of the herd;
- implementation of a breeding programme for protection of genetic resources of a particular ovine breed;
- no more than 30 ewes per 1 ram.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environment payments - 320 PLN/animal

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Additional cost		
1.	Preparation of pasture (isolation of plots with electric fence)		
2.	Conducting additional performance control		
3.	Keeping breeding documentation		
	Lost income		
4.	Lost Standard Gross Margin		
Estimated balance of costs and benefits		329 PLN	
PROPOSED LEVEL OF PREMIUMS (97%)		**320 PLN/unit (82 EUR/unit)**	

1. Cost of preparation of pasture by isolation of plots with electric fence - according to the Polish Union of Sheep Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003), CSO;
2. Cost of conducting additional performance control for request of the National Protection Programme (time needed for keeping documentation x cost of manhour) - according to the Polish Union of Sheep Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003), Central Station of Livestock Breeding and CSO;
3. Cost of keeping breeding documentation for sheep in accordance with the price-list of the entity keeping herdbooks and performance evaluation - according to the Polish Union of Sheep Breeders and Institute of Zootechnics of Balice near Cracow (2001-2003);
4. >Lost Standard Gross Margin (LU value x SGM per 1 ha of UAA) - according to the CSO and Agricultural Accountancy Department of IAFE NRI.

Variant 7.4. Preservation of local pig breeds

Description: The package covers porcine breeds for which programmes for genetic resources protection are implemented: Puławska, Złotnicka biała and Złotnicka pstra. These breeds originate from primitive pigs from Poland and the Vilnius County.

Development of the population of local porcine breeds in present market conditions would be impossible due to worse fattening and slaughter performance as compared to meat-producing breed and their hybrids. Pigs of local breeds have features which in the future may be used in breeding, and at present they are a genetic reserve. These features include mainly the following: good fertility, fecundity and female features, very good quality of

meat, resistance to diseases and genetic and phenotype dissimilarity from high-production pigs.

Requirements of Variant 7.4.:

- minimum number of sows of one breed in the basic herd qualified for the protection programme in a herd*:
  porcine animals of the Puławska breed – 10 animals
  porcine animals of the Złotnicka biała breed – 8 animals;
  porcine animals of the Złotnicka pstra breed – 8 animals;
- sows from the basic herd of more than 70 porcine animals of the Puławska breed and 100 porcine animals of the Złotnicka biała or Złotnicka pstra breed are not eligible to payment;
- carrying out utility evaluation and breeding documentation in the herd;
- entering sows into a register of breeding animals of a particular breeds;
- implementation of a breeding programme for protection of genetic resources of a particular porcine breed.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

* Lower number of the basic herd in the case of Złotnicka biała breed sows is allowable – 6 animals and in the case of Złotnicka pstra breed sows – 3 animals is allowable in herds covered by the programme before 31 December 2005.

Amount of agri-environment payment – PLN 570/animal
Payment calculation: (per 1 sow with offspring):

No	Measures undertaken	Cost	Benefit
	Lost income		
1.	Lost Standard Gross Margin	x	
	Additional costs		
2.	Carrying out additional control	x	
3.	Keeping breeding documentation	x	
Estimated balance of costs and benefits		571.5 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**570 PLN/unit (146 EUR/unit)**	

1. lost standard gross margin (LU value x SGM per 1 ha of UAA) – on a basis of data of CSO and Agricultural Accountancy Department IAFE;
2. cost related to carrying out additional control for the purpose of the National Protection Programme (time needed to carry out additional controls x cost of manhour) - on a basis of data from National Centre for Animal Breeding, data of CSO, data of Agricultural Accountancy Department IAFE, data of Polish Pig Breeders and Producers Association "POLSUS";
3. cost related to keeping breeding registers for pigs, in accordance with the price list of breeding registers managing entity, as well as performance evaluation, on a basis of data of National Centre for Animal Breeding, data of CSO, data of Agricultural Accountancy Department IAFE, data of Polish Pig Breeders and Producers Association "POLSUS";

Conversion table of payment rates per animal to livestock unit (LU) in a package Preservation of endangered animal genetic resources in agriculture.

Type of animal	LU conversion factors*	Payment rate (PLN)	
		per animal	per 1 LU
Cows	1.00	PLN 1,140	1,140
Mares	1.20	PLN 1,500	1,250
Sheep	0.10	PLN 320	3,200
Sows	0.35	PLN 570	1,629

Conversion factors of animals to livestock unit in accordance with the Council of Ministers Regulation on specifying the types of undertakings of potential significant influence on environment and specific conditions concerning the eligibility of an undertaking to a report on the influence on the environment.

Package 8. Protection of soil and water
Variant 8.1. Undersown catch crop
Variant 8.2. Winter catch crop
Variant 8.3. Stubble catch crop

Description: The major sources of water contamination of agricultural origin include the following: nutrients (nitrogen, phosphorus) provided in natural and mineral fertilisers, residues of plant protection products and other toxic substances, including hard metals, as well as organic an non-organic soil particles. In general, water contamination with nitrates of agricultural origin is present in regions having high concentration of livestock production and intensive crop production, including vegetable and fruit production regions where large dozes of fertilisers and plant protection products are applied. Maintaining plants in arable land in the form of sowing one species or a mix of several species of plants in the period between two main harvests prevents water contamination and erosion. This also influences structural diversification of biodiversity in rural landscape through creation of living environment for various plants and animals, and it also constitutes an additional source of feed for animals.

Objective: Proper use of soil and water protection

Agri-environmental payment is granted in the amount of

1) 100% of basic rate – for the area between 1 ha and 100 ha;
2) 50% of basic rate – for the area between 100.01 ha and 200 ha;
2) 10% of basic rate – for the area above 200 ha;

Variant 8.1. Undersown catch crop

Definition: Undersown catch crop consists in sowing plants in spring in-between a growing winter plant (usually cereal) or together with sowing spring plants.

Requirements of Variant 8.1.:

- sowing plants in-between growing winter plants or together with sowing spring plants, and keeping them throughout the whole winter period;
- removal of straw from the whole field after harvest;
- possibility of renewal of agrotechnical treatment before 1 March;
- grazing allowable;
- biomass of undersown catch crop should be ploughed, except non-tillage soil cultivation system.

- possibility of alternate use of undersown catch crop in various agricultural plots within 5 years;
- not using sewage and sewage sludge for catch crop.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment is 300 PLN/ha
Payment calculation:

	Measures undertaken	Cost	Benefit
	Lost income		
1.	Lower standard gross margin in the main yield	x	
	Additional costs		
2.	Purchase of seeds	x	
3.	Sowing more seeds	x	
	Additional income		
4.	Improvement in soil quality in the following year		x
5.	Reduction of nitrogen dose for subsequent harvest		x
Estimated balance of costs and benefits		456 PLN	
PROPOSED LEVEL OF PREMIUMS (72%)		**330 PLN/unit (84.5 EUR/unit)**	

1. standard gross margin lower for plants in main yield (SGM for 2002 per 1 ha of UAA x % SGM volume lost) – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
2. additional cost related to purchase of seeds – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
3. additional cost related to sowing more seeds – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
4. Improvement in soil quality in the following year by 3% – according to data of CSO, data of Institute of Soil Science and Plant Cultivation in Puławy for 2001-2003;

5. reduction of nitrogen dose for subsequent harvest (amount of Nitrogen dose x cost) – according to data of CSO, data of Institute of Soil Science and Plant Cultivation in Puławy for 2001-2003.

Variant 8.2. Winter catch crop

Definition: Winter catch crop is sown after harvest of late maturing cereals (wheat, triticale, oat). It is possible to cultivate catch crop in interrows of hop-yard, assuming that a hop plantation having area of 1 ha, the area covered by catch crop accounts for 67%. This relates to granting agri-environmental payment in such a proportion for a particular hectare.

Requirements of Variant 8.2.:

- sowing of aftercrop plants (winter plants) by the end of September;
- using only natural fertilisers for catch crop
- not using sewage and sewage sludge for catch crop;
- biomass of aftercrop plants should be ploughed, except for no-tillage soil cultivation system;
- possibility of mowing or fattening with biomass of aftercrop plants in spring;
- possibility of renewal of agrotechnical treatment after 1 March;
- possibility of alternate use of catch crops in various agricultural plots within 5 years;

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment is 420 PLN/ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Gross margin from subsequent harvest lower by 30%[21]	x	

[21] According to agronomic knowledge, loss of standard gross margin from subsequent harvest accompanying the winter catch crop is higher than in the case of undersown catch crop (Institute of Soil Science and Plant Cultivation).

	Additional costs		
2.	Purchase of seeds	x	
3.	Costs of plantation/sowing	x	
	Additional income		
4.	Reduction of nitrogen dose for subsequent harvest		x
Estimated balance of costs and benefits		751 PLN	
PROPOSED LEVEL OF PREMIUMS (56%)		**420 PLN/ha (107.6 EUR/ha)**	

1. standard gross margin lower for subsequent harvest (SGM for 2002 per 1 ha of UAA x % SGM volume lost) – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
2. additional cost related to purchase of seeds – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
3. additional cost related to plantation/sowing: time of implementation x cost of manhour for first ploughing/sowing – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
4. reduction of nitrogen dose for subsequent harvest (amount of Nitrogen dose x cost) – according to data of CSO, data of Institute of Soil Science and Plant Cultivation in Puławy for 2001-2003.

Variant 8.3. Stubble catch crop

Definition: Stubble catch crop is sown just after harvest of the major crop (e.g. rye, barley) at the beginning of August. There may be one-species or multi-species (mix) sowing. Catch crop biomass leaves a protective cover for winter, the so-called mulch.
It is possible to cultivate catch crop in interrows of hop-yard, assuming that a hop plantation having area of 1 ha, the area covered by catch crop accounts for 67%. This relates to granting agri-environmental payment in such a proportion for a particular hectare.

Requirements of Variant 8.3.:

- sowing of aftercrop plants (spring plants) by the end of September;
- using only natural fertilisers for catch crop

- not using sewage and sewage sludge for catch crop;
- biomass of aftercrop plants should be ploughed, except for no-tillage soil cultivation system;
- possibility of fattening with biomass of aftercrop plants in autumn;
- possibility of renewal of agrotechnical treatment after 1 March;
- possibility of alternate use of catch crops in various agricultural plots within 5 years;

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment - PLN 400 per ha

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
	Lost income		
1.	Lower gross margin from subsequent harvest	x	
	Additional costs		
2.	Costs of plantation/sowing	x	
3.	Purchase of seeds	x	
	Additional income		
4.	Reduction of nitrogen dose for subsequent harvest		x
Estimated balance of costs and benefits		695 PLN	
PROPOSED LEVEL OF PREMIUMS (58%)		**400 PLN/ha (102.5 EUR/ha)**	

1. standard gross margin lower for subsequent harvest (SGM for 2002 per 1 ha of UAA x % SGM volume lost) – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
2. additional cost related to plantation/: time of implementation x cost of manhour for first ploughing/sowing – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;

3. additional cost related to purchase of seeds – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy (prof. S. Krasowicz and J. Kuś) and Agricultural Accountancy Department of IAFE;
4. reduction of nitrogen dose for subsequent harvest (amount of Nitrogen dose x cost) – according to data of CSO, data of Institute of Soil Science and Plant Cultivation in Puławy for 2001-2003.

Package 9. Buffer zones

Variant 9.1. Maintenance of 2-metre buffer zones
Variant 9.2. Maintenance of 5-metre buffer zones
Variant 9.3. Maintenance of 2-metre field baulks
Variant 9.4. Maintenance of 5-metre field baulks

Description: The Measure consists in preservation of the existing buffer zones and field baulks forming longitudinal strips of plants aimed to reduce water contamination, reduce erosion and increase biodiversity.
There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Objective: Proper use of soil and water protection

Variant 9.1. Maintenance of 2-metre buffer zones
Variant 9.2. Maintenance of 5-metre buffer zones

Description: Buffer zones are 2-metre or 5-metre wide (in the narrowest spot), longitudinal strips of greenery, placed alongside water-courses, small water reservoirs, streams, springs, aimed to reduce water contamination. The width of a zone is measured starting from the edge of a water-course or water reservoir.

Requirements of Variant 9.1. and 9.2.:
- keeping a 2 or 5-metre wide buffer zone;
- mowing once a year or once every two years, 30 September at the latest, preserving the existing trees and bushes;
- use of fertilisers and plant protection products is prohibited;
- removal of biomass within the 2 weeks time after mowing.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment is 2,243 PLN/ha
for a 2-metre wide buffer zone – **PLN 44 / 100 running metres**
for a 5-metre buffer zone – **110 PLN/100 running metres**

Payment calculation:

	Measures undertaken	**Cost**	**Benefit**
Lost income			
1.	Loss of standard gross margin	x	
	Additional costs		
2.	Mowing	x	
3.	Removal of the cut biomass	x	
4.	Lost area payment	x	
5.	Lost LFA payment	x	
	Additional income		
6.	Value of hay for bedding		x
Estimated balance of costs and benefits		**2,243 PLN**	
PROPOSED LEVEL OF PREMIUMS (100%)		**2,243 PLN/ha (574.6 EUR/ha)**	

1. loss of standard gross margin (exclusion of the area from production);
2. Cost of mowing related to unfavourable conditions (partly manual) – according to data of IAFE NRI. (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy. 2001-2003. And data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery. Muzalewski A. 2001-2003. Koszty eksploatacji maszyn. IBMER, Warszawa);
3. cost of the biomass removal – according to data of IAFE NRI (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy 2001-2003) and data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery (Muzalewski A. 2001-2003. Koszty eksploatacji maszyn, IBMER, Warsaw);

4,5. Lost direct payment and lost LFA payment (average value per 1 ha)

6. value of hay for bedding (amount of hay for bedding x cost of hay) – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy, CSO, Mały poradnik zarządzania gospodarstwem rolniczym, IAFE G. Niewęgłowska, ed.).

Agri-environmental payment calculation for a buffer of various widths per 100 running metres

Width of buffer zone (average)	(PLN/100 running metres)
2m	0.02 x PLN 2,243 = PLN 44 (11.3 EUR)
5m	0.05 x PLN 2,243 = PLN 110 (28.2 EUR)

Variant 9.3. Maintenance of 2-metre field baulks
Variant 9.4. Maintenance of 5-metre field baulks
Description: Field baulks are 2-metre or 5-metre wide (at the narrowest spot) longitudinal strips of greenery, including hedges located on large fields, alongside a forest line or at the edge of gorges or escarpments.

Requirements of Variant 9.3. And 9.4.:

- keeping a 2 or 5-metre wide field baulk;
- mowing once a year or every two years, 30 September at the latest, preserving the existing trees and bushes; in the case of hedges - nurturing;
- the use of fertilisers and plant protection products is prohibited.

There is an obligation to maintain the area of permanent grasslands and landscape elements not used for agricultural purposes in the whole area of an agricultural holding covered by the agri-environmental programme.

Amount of agri-environmental payment is 2,033 PLN/ha
for a 2-metre field baulk – PLN 40/100 running metres
for a 5-metre field baulk – PLN 100/100 running metres

Payment calculation:

	Measures undertaken	Cost	Benefit
Lost income			
1.	Lost standard gross margin	x	
	Additional costs		
2.	Mowing	x	
3.	Lost area payment	x	
4.	Lost LFA payment	x	
	Additional income		
5.	Value of hay for bedding		x
Estimated balance of costs and benefits		2,033 PLN	
PROPOSED LEVEL OF PREMIUMS (100%)		**2,033 PLN/ha (520.8 EUR/ha)**	

1. loss of standard gross margin (exclusion of the area from production);
2. cost of mowing in unfavourable conditions (partly manual) – according to data of IAFE NRI. (Klementowski A. Rynek Środków Produkcji i Usług dla Rolnictwa. Stan i perspektywy. 2001-2003. And data of the Institute for Building, Mechanisation and Electrification of Agriculture concerning the cost of machinery. Muzalewski A. 2001-2003. Koszty eksploatacji maszyn. IBMER, Warszawa);

3, 4. lost direct payment (and lost LFA payment (average value per 1 ha);

5. value of hay for bedding (amount of hay for bedding x cost of hay) – data on a basis of studies of Institute of Soil Science and Plant Cultivation in Puławy, CSO, Mały poradnik zarządzania gospodarstwem rolniczym, IAFE G. Niewęgłowska, ed.) 2002.

Calculation of agri-environmental payment for a field baulk of various widths per 100 running metres.

Width of field baulk (average)	(PLN/100 running metres)
2m	0.02 x PLN 2,033 = PLN 40 (10.2 EUR)
5m	0.05 x PLN 2,033 = PLN 100 (25.6 EUR)